MAFF FOOD RESEARCH

REQUIREMENTS DOCUMENT

1999 - 2000

MARCH 1998

Ministry of Agriculture, Fisheries and Food

MAFF FOOD RESEARCH REQUIREMENTS 1999-2000

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Foreword from the Chief Scientist

I am pleased to launch the Ministry of Agriculture, Fisheries and Food, Food Research Requirements Document for financial year 1999/2000.

The research requirements identified in this document fall mainly within the responsibility of the Joint Food Safety and Standards Group and cover chemical and microbiological food safety, meat hygiene, food quality and applied nutrition. The research is commissioned to support policy in these areas. The document also includes information on the Food and Drink Manufacturing and Distribution Industries Division's LINK and related initiatives as these initiatives enable participation by industry in collaborative research programmes to improve, amongst other things, food safety. The document does not include requirements for the Ministry's needs in the areas of TSEs, Zoonoses, pesticides and veterinary medicines, all of which have some impact on food safety issues. Research in these other areas is commissioned by different groups within MAFF. A Research Requirements Document for the Animal Health Group will also be published later this year.

As many of you will be aware, the White Paper on The Food Standards Agency: A Force for Change was published in January. It set out proposals for a Food Standards Agency to promote high standards in the food chain from the point of production to the point of consumption. It is expected that this Agency will be formally established in late 1999 and take responsibility for the research programmes referred to in this document (except for the work under the LINK and related initiatives).

We are constantly trying to improve and update our processes and this year I am very pleased to announce that the Food Research Requirements Document 1999/2000 will be available on the MAFF Website. In addition, electronic copies of the application form are available by return e-mail. Details of this can be found in the introductory section of the document which I would urge you to read.

I hope you find these new developments useful and that they will improve our service to potential contractors and interested organisations. Following the receipt of applications, my Group will be sending all respondents a questionnaire on the document and I would very much appreciate any comments you may have on the document and the commissioning process.

Dr D W F Shannon
Chief Scientist

Ministry of Agriculture, Fisheries and Food
Chief Scientist's Group, Food and Veterinary Science Division
St Christopher House, Southwark Street, London SE1 0UD

March 1998

Dear Colleague

MAFF FOOD RESEARCH REQUIREMENTS 1999-2000

Please find enclosed a copy of the MAFF Food Research Requirements Document, produced by the Chief Scientist's Group. The publication serves as a guide for prospective contractors who wish to submit proposals to the Ministry for research in these specific areas. It is expected that there will be some additional calls for applied research under some programmes later this year. As in previous years, a separate call will also be made for surveillance work.

I would be grateful if you could circulate this document amongst other staff and departments within your organisation who might also be interested in submitting applications.

The enclosed document will provide you with all the necessary information on the research requirements, guidance on how to apply and a copy of the application form. I would strongly encourage you or your staff to discuss any ideas you might have with the relevant people named under the 'further information' section(s) of the requirements document, to ensure any proposal you make is in line with our requirements. I should also like to emphasise that as food research is multi-disciplinary, contributions from a wide range of disciplines may be required to meet the stated objectives.

You should read this document carefully, especially the guidance for applicants section, before completing the application form. MAFF requires eight copies of both the application form and a one page executive summary in support of every research proposal submitted. Unfortunately we are unable to accept faxed or e-mailed applications, and any application received after the closing date will not be considered.

The final date for receipt of applications is Monday 22 June 1998.

Potential applicants should note that the Ministry's R&D contractual terms and conditions, including the general format of the contract, are currently under review. Copies of the revised terms and conditions, which will apply to work awarded under this current requirements exercise, should be available by E-Mail by 15 April (E-Mail address: help-csg@auto-reply.maff.gov.uk). Alternatively, from that date, copies should be obtainable by telephoning 0171-921-2327.

For advice on completing the application form you should contact one of the helpline numbers listed under Annex III. Information on estimating costs is given in Section Three of the application form (CSG7) at Annex III. For specific enquiries of a scientific or policy nature please refer to the contacts listed at the end of the appropriate research programme. If you require more general information or additional copies of the application form or research requirements document, I will be pleased to be of assistance.

Yours faithfully

Bernadette Okeke
Food and Veterinary Science Division
MAFF Chief Scientist's Group

BACKGROUND

1. MAFF funds research to investigate specific problems, to develop policy options, implement solutions and assess their effectiveness. Funds may support research where policy changes require new knowledge. This research contributes to the strategic aims of the Ministry which are:

- To protect the public.
- To protect and enhance the rural and marine environment.
- To improve the economic performance of the agriculture, fishing and food industries.
- To protect farm animals.

2. Further information on the aims and objectives of MAFF is available in the MAFF/ IB Departmental Report 1997 (MAFF Publications, Admail 6000, London, SW1A 2XX, Tel: 0645 335577).

3. The research requirements for the Joint Food Safety and Science Group (JFSSG) and the Food and Drinks Industry Division (FDID) of MAFF are defined according to the research programmes whose rationales have been published in the MAFF Research Strategy Document 1996-2000. This document sets out the relationship between MAFF policy and supporting research programmes. It identifies how research needs can be addressed and how industry, academia and research organisations can contribute. Copies are available from MAFF Publications, London, SE99 7TP.

4. The work carried out under the MAFF Food Safety, Quality and Nutrition Research Programmes supports the Ministry's strategic aim of protecting the public.

5. For research to achieve its purpose the results must be effectively transferred to the user. Within the Ministry this is facilitated by the direct contribution of research to the formulation and implementation of policy. Most of the research requirements identified in this document concern longer term strategic research needs which are expected to influence policy at some point in the future. Applied research is intended to meet specific, short term and well defined research needs.

GUIDANCE FOR APPLICANTS

GENERAL

6. Please note further copies of this document are also available on the MAFF Website at http://www.maff.gov.uk/r@d/summary/req9920.pdf

7. To apply for MAFF funding for the financial year 1999/2000, potential contractors are requested to submit eight copies of the following in support of each research proposal:

i) A completed standard application form, CSG 7 (Rev. 3/97).
ii) An executive one page summary of the proposal.

Electronic versions of the CSG 7 form are available and applicants are strongly encouraged to use this format. Copies of the form can be obtained using the e-mail auto reply service as explained below.

USE OF THE E-MAIL AUTO-REPLY FACILITY.

The e-mail auto-reply system allows a document to be sent, via e-mail, in response to a request which has been received, also via e-mail. The response is totally automatic and simply requires the person requesting the information to send an e-mail (with no text) to:

help-csg@auto-reply.maff.gov.uk

In the subject/title box the sender must enter the name (Keyword) of the document that they wish to receive. If you are unsure of the name of the document then the subject box can be left blank and you will receive an index. The index lists the documents available and a brief description of their contents.

At the moment the index looks something like this:

****
AUTO-REPLY: THE MAFF400 ON-LINE INFORMATION RETRIEVAL SYSTEM
****

To use this system please send a message (with no text) using the appropriate KEYWORD as the subject/title to help-csg@auto-reply.maff.gov.uk

Keyword	**Publication Name**
csg7.dot	Application for a Research Contract with MAFF
csg7a.dot	Annex A (Curriculum Vitae) & Annex B (Bibliography)
csg7inst.doc	Instructions for installation and use of CSG7 and CSG7a templates
csg12.dot	Annual/Interim Project Report template
csg13.dot	Final Project Report template
12_13inst.doc	Instructions for installation of the CSG12 and CSG13 templates
repguide.doc	Guidance notes for completion of the CSG13 form

In the event of difficulty with this service please contact Dr Bernadette Okeke Tel: 0171 921 3965

If the electronic version of the CSG 7 is used please submit both the disc/ e-mail and eight hard copies.

8. A copy of the standard application form and notes on its completion are located at Annex III. Applicants must clearly identify which paragraph(s) of the Research Requirements Document their proposal addresses in Section 5 (a). Details of the cost and time-scale of the project must be given. Proposed start dates for research should be after 1 April 1999. Financial guidelines for project cost estimates are contained in Section Three of the form. Forms may be completed by hand, or submitted as word processed documents. Please do not exceed 120 characters for the project title.

9. Potential contractors should note that in the absence of the executive summary it will not be possible to process applications.

10. All proposals submitted should fall within the scientific objectives of one or more of the programmes listed in this document. Potential contractors must detail the scientific objectives of the project and the experimental approaches envisaged. They must also indicate on the application form which requirement(s) in this document their proposal relates to. In the case of joint applications, each individual laboratory should submit a separate application form detailing the aspects of the project that it will be carrying out and clearly indicate on the application form that it is part of a joint application. Each section of this document provides details of a contact person for each programme and potential applicants are **strongly encouraged** to contact the person identified with any questions they may have concerning the programme and to discuss their proposals.

11. Where a proposal involves human dietary trials, potential contractors must provide detailed protocols appended to the application form containing the following:

- Numbers of subjects involved and statistical power.
- Matching of individuals (age, sex, BMI, physical exercise, smoking habits, ethnicity).
- Compliance.
- Seasonal variation.
- Ethical committee approval.
- Measurement of background dietary habit.
- Methods to be used for dietary records.

12. Potential applicants are encouraged, where appropriate, to make use of the food consumption data collected in surveys and in particular the Government funded National Diet and Nutrition Surveys:

- 'The Dietary and Nutritional Survey of British Adults 1990' (HMSO. ISBN: 0116913002).
- 'The Dietary and Nutritional Survey of British Adults - Further Analysis 1994' (HMSO. ISBN: 0112429661).
- 'NDNS Children Aged 1½ to 4½ Years 1995' (HMSO. ISBN 0116916117).

13. Such surveys provide opportunities to examine changes in dietary habits and food choice in relation to health measures, lifestyles, social circumstances and mortality. Mrs Susan Church (MAFF Radiological Safety and Nutrition Division Tel: 0171 238 5764) can provide prospective contractors with further information and advice on using survey data.

14. Applicants should note that for any research proposals involving human experimentation and human tissues, details of ethical committee approval **must** be submitted. It is also recommended that any volunteers participating in MAFF funded studies are adequately covered by insurance arranged by the contractor. MAFF accepts no liability for any loss, damage, personal injury or death arising from the contractor's use of human volunteers subject to the overriding provisions of the Unfair Contract Terms Act 1977.

15. All proposals should be submitted to:

Dr Bernadette Okeke
Ministry of Agriculture, Fisheries and Food
Room 668
St Christopher House
Southwark Street
London
SE1 0UD

Tel: 0171 921 3965

ALL APPLICATIONS MUST BE RECEIVED BY 22 JUNE 1998. WE REGRET THAT FAXED OR E-MAILED APPLICATIONS OR APPLICATIONS RECEIVED AFTER THIS DATE CANNOT BE CONSIDERED.

NEW PROCEDURES

16. For the 1999/2000 Commissioning Round it is proposed to send out a questionnaire to those receiving the Research Requirements Document following the deadline for submission of proposals. This will request feedback on the requirements document e.g. ease of use, faults, suggested improvements etc. The results of the survey will then be used to inform production of future requirements documents.

17. MAFF currently has an extensive circulation list of individuals who wish to receive copies of the MAFF Food Research Requirements Document. This list is to be updated in 1998. If you wish to be included on the updated list and to receive future copies of this document, then please complete the form on page 10 and return it to MAFF.

SELECTION CRITERIA (STRATEGIC)

18. All proposals for strategic research are critically evaluated by the Chief Scientist's Group (CSG), policy customers (JFSSG and FDID) and independent appraisal panels consisting of the MAFF Programme Adviser and acknowledged experts in the relevant field. Each proposal is carefully judged against all the following criteria:

- Relevance to the policy customers' requirements.
- Overall scientific quality and value-for-money.

- Where research has the potential to, or is intended to, lead to a technological development, the proposal has the support of a potential industrial partner or user.
- Whether the approach proposed is the most feasible.
- Likelihood of achieving the stated objectives within the proposed time frame.
- Research not already supported elsewhere.

19. In addition, for much of the work in food safety and applied nutrition, it will be important to demonstrate that there is collaboration between scientists covering the multi-disciplinary skills which are frequently necessary to achieve effective advances. The collaboration often crosses the traditional boundaries of Research Councils and University Departments.

20. The proposed timetable for the 1999/2000 funding round is set out below. After the closing date for applications (22 June 1998), the proposals will be distributed to; Programme Advisors, MAFF Policy Divisions and independent experts where appropriate.

21. From July onwards, an evaluation of each application will be carried out by CSG, policy advisors and the independent experts. Applications which do not meet the policy objectives or research requirements stipulated will be rejected. Following the receipt of written appraisals from the independent assessors, meetings will be convened by CSG and Policy Divisions in September for each research programme, where appropriate, to take decisions on which projects to fund. At this stage some projects may be placed on a reserve list as acceptable for funding if resources are available. MAFF will aim to reach final decisions on these projects early in 1999.

22. By the end of October 1998, all potential contractors will have been informed of the outcome of the assessment procedure. Applications will either have been accepted in principle for funding, in which case post-tender negotiations may be required before a contract can be prepared, placed on a reserve list pending the completion of the annual Public Expenditure Survey or will have been rejected. Contractors will be informed why a proposal could not be supported but it must be appreciated that limited resources preclude any detailed discussions on the reasons for rejection.

SELECTION CRITERIA (APPLIED)

23. The selection criteria set out above are also used to assess proposals for applied research. However, the evaluation procedure is carried out by the appropriate Policy Division and the Chief Scientist's Group. Independent appraisal will be sought where appropriate.

PROPOSED TIMETABLE (STRATEGIC)

24. The timescale below sets out the latest dates for completion of the actions indicated.

Date	Action
22 June 1998	Closing date for receipt of proposals.
3 July 1998	Proposals distributed to policy divisions, Programme Advisors and independent external experts.
10 July 1998	Applicants acknowledged of receipt.
14 August 1998	Receipt of appraisals from CSG, policy divisions, Programme Advisors and external experts.
1 - 18 September 1998	Appraisal Panels or other meetings between CSG, policy divisions and Programme Advisors to discuss scientific merits of the research proposals.
21 September - 2 October 1998	Meetings between CSG and policy divisions to agree proposals to be accepted for funding and placed on reserve list.
30 October 1998	All applicants informed of the outcome of the appraisal of their proposals.

PROPOSED TIMESCALE (APPLIED)

25. The timescale for the completion of assessment of applied research proposals and informing applicants is identical to that set out above for strategic research.

MONITORING OF PROGRESS

26. All research projects commissioned by MAFF are monitored according to the milestones and key measures of achievement laid down in the Contract. For each research programme, MAFF has appointed Programme Advisors to assist in managing specific research programmes. In particular they:

- Encourage co-operation and interchange of ideas amongst the contractors contributing to the programme.
- Regularly monitor progress by individual contractors.
- Inform the Chief Scientist's Group of any developments and advise on the need to set new milestones or goals as the research progresses.
- Organise regular workshops between contractors, MAFF officials and management committees where appropriate.

27. Programme Advisors report to the Chief Scientist's Group who in turn advise the relevant policy divisions on progress in the research projects.

28. The current portfolio of projects in the MAFF food research programmes is provided at Annex II.

INTELLECTUAL PROPERTY RIGHTS

29. The Ministry's aim is to promote the effective transfer of new technology arising from MAFF funded work to industry through the Intellectual Property Rights (IPR) system. At present the Ministry implements this policy by retaining IP ownership of the results of MAFF funded research and collaborating closely with its contractors in deciding how to exploit the IP. The royalty income arising from the IPR system is shared between MAFF and the contractor. However, this policy is currently under review and may also be affected by the implementation of the Food Standards Agency (FSA). The latest situation can be obtained by contacting MAFF's Research Policy Co-ordination Division, Branch D (Tel: 0171 921 2303).

EUROPEAN COMMUNITY FRAMEWORK PROGRAMME

30. Framework programme IV which included the FAIR Programme comes to an end in 1998. There will be no further calls for proposals in this Programme.

31. A common position has been reached on Framework Programme V which contains four thematic research programmes. Theme 1 entitled "Improving the quality of life and management of living resources" contains the following Key Actions from which specific programmes will be elaborated:

- Food, Nutrition and Health.
- Control of Infectious Diseases.
- The "Cell Factory".
- Environment and Health.
- Sustainable Agriculture, Fisheries and Forestry, Including Integrated Development and Rural Areas.
- The Ageing Population.

32. The aim of the food nutrition and health key action is to promote the development of knowledge, technologies and methods, including prenormative aspects, based on multidisciplinary approaches to produce a safe, healthy, balanced and varied food supply for consumers covering the whole food chain. Priority areas for research have been identified as:

- The development of safe, flexible and new/improved manufacturing technologies to improve food quality and consumer acceptability, while guaranteeing traceability of raw materials and final products.
- The development of tests to detect and processes to eliminate infectious and toxic agents throughout the food chain.
- Research into the role of food in promoting and sustaining health with respect to diet and nutrition, toxicology, epidemiology, environmental interaction, consumer choice and public health.

33. Support is likely to be similar to Framework programme IV, namely:

i. Shared cost actions (EC contribution of up to 50% of total project costs).

ii. Concerted actions (EC contributions of up to 100% of co-ordination of activities).

34. The Ministry wishes to encourage applications by UK research organisations and SMEs to the EU. The Ministry will consider providing applicants with additional national support for shared cost actions where these are in accordance with the Ministry's own research requirements as defined in this document. Potential applicants are advised to contact the appropriate programme advisor listed in this document to discuss their ideas with a view to obtaining MAFF support.

Any queries relating to Framework V should be directed to Mr L Broadbere Tel: (0171) 921 1187.

Applications should be submitted to:

Mr L Broadbere
Ministry of Agriculture, Fisheries and Food
Room 632
St Christopher House
Southwark Street
London
SE1 0UD

The first call for proposals in Framework V will be December 98/January 99.

NEW CIRCULATION LIST FOR MAFF FOOD RESEARCH REQUIREMENTS DOCUMENT FROM 1999 ONWARDS.

The circulation list for the MAFF Food Research Requirements Document will be updated in 1998. Therefore, we are asking all those who still wish (or wish in the future) to receive the document on an annual basis to complete the attached proforma and return it to us as soon as possible.

To ensure that the mailing list is updated in time for next years Requirements Document, please send in your completed proforma by **31 December 1998**.

PLEASE NOTE, THAT IF AFTER THIS DATE YOU HAVE NOT RETURNED THE SLIP BELOW, WE WILL ASSUME THAT YOU NO LONGER WISH TO RECEIVE THE REQUIREMENTS DOCUMENT AND WILL REMOVE YOUR DETAILS FROM OUR CIRCULATION LIST.

Thank you for your co-operation.

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MAFF FOOD RESEARCH REQUIREMENTS DOCUMENT: NOTIFICATION FOR INCLUSION ON MAILING LIST FROM 1999 ONWARDS.

Name: _____

Address: _____

_____

_____

_____

_____

Signed **Date**

Please return the completed proforma to Dr Bernadette Okeke, MAFF, Room 668, St Christopher House, Southwark Street, London SE1 0UD.

FOOD QUALITY & NUTRITION

INTRODUCTION

35. MAFF's objective in this area is to provide consumers with the information they need to choose a healthy and nutritious diet. Positive changes in the diet can reduce the risk of disease, and these changes could be an important factor in meeting the targets proposed in *Our Healthier Nation: A Contract for Health*. The Ministry's need is therefore to give dietary advice based on the best available scientific evidence.

36. Research is still needed to ensure that dietary advice is based on robust scientific evidence and to improve the basis on which Dietary Reference Values (DRV's) can be set. There is a need to improve our understanding of how dietary constituents such as lipids, carbohydrates, antioxidants and various micronutrients can affect the onset and progression of chronic disease such as cardiovascular disease, stroke and cancer.

37. As the Ministry's nutrition research programmes are concerned with the diet and health of humans, it is important that potential projects focus on research in human beings and, wherever possible, *in vivo*. There may be exceptional circumstances where *in vitro* and animal model experiments are appropriate.

DIETARY LIPIDS (AN02)

INTRODUCTION

38. Lipids are an essential part of the diet and provide energy, essential fatty acids and fat soluble nutrients. However, both the level and type of fat have been implicated in the aetiology and/or progression of a number of different diseases including vascular diseases, cancer, inflammatory conditions and insulin resistance. It has been widely hypothesised that these diseases may be prevented or alleviated by alterations to the diet such as changing the percentage of energy consumed as dietary lipid, the ratio of saturated to unsaturated fatty acids, the type of unsaturated fatty acids consumed or the chemical structure of triacylglycerol contained in lipid. Such hypotheses form the basis of the research funded in the Dietary Lipids research programme. The results from this research should enable the consumer to choose a healthier diet and the food industry to manufacture healthier food products.

STRATEGIC RESEARCH REQUIREMENTS

39. There is a wealth of literature on the potentially detrimental effects of a high level of total saturated fat in the diet. There is also clear evidence that different individual saturated fatty acids have very different effects on cholesterol/lipoprotein metabolism *in vivo*. However, there is limited published data concerning the role of individual saturated fatty acids on haemostatic and vascular function. Proposals are invited which:

A. *Determine the specific, in vivo effects of individual saturated fatty acids on haemostatic and vascular function in man.*

40. The 1996 Review of MAFF Nutrition R&D recognised the inherent problems in applying a population approach in this area to a heterogeneous population. Further research is needed to address the issues of diet-related cardiovascular disease risk factors in significant sub-groups of the UK population. Such groups may have a genotypic identity (e.g. a specific genetic polymorphism) or may exhibit a different phenotype due to differences in lifestyle and/or diet. The focus in 1999/2000 will be on those groups which can be identified by their cultural background as having significantly different risk factors. Proposals are invited which:

B. *Determine the dietary factors which impact on lipid-related cardiovascular disease risk in groups with a distinct cultural identity (e.g. certain groups of Asian origin) and identify potential targeting of dietary advice for these groups.*

41. The Ministry wishes to encourage UK participation in the forthcoming EU Fifth Framework Programme. It is recognised that some methodology currently used in lipids research may need further development to suit the needs of pan-European dietary intervention trials. Proposals are invited to:

C. *Improve methods used in the measurement of lipids in vivo to ensure that UK laboratories are well placed to play a significant part in future European initiatives.*

42. The next formal Review of the Dietary Lipids Programme will take place in 2001. To assist this Review process, an external scientist will be asked to examine the results of the Dietary Lipids Programme to date and place them in the context of the broader international research effort. The successful applicant will also be asked to identify future collaborations and produce an audit of stored samples for future analysis. Applications are invited from scientists with considerable experience in the Dietary Lipids area to:

D. *Review and evaluate research from the MAFF Dietary Lipids Research Programme and, as far as possible, other similar programmes, consolidate the findings of that research; and present the findings in a format which can be disseminated easily.*

FURTHER INFORMATION

43. For advice on specific scientific issues prospective contractors are advised to contact Mr Christopher J. Darby, Food and Veterinary Science Division, MAFF (Tel: 0171 921 2393, Fax: 0171 921 1121). For advice or information on the policy background/objectives of this programme please contact Mr S Wearne, Radiological Safety and Nutrition Division, MAFF (Tel: 0171 238 6750).

PLEASE READ CAREFULLY THE SECTION ENTITLED 'GUIDANCE FOR APPLICANTS' (PAGES 3-9) BEFORE SUBMITTING YOUR PROPOSAL.

ROLE OF COMPLEX CARBOHYDRATES IN THE DIET (AN03)

INTRODUCTION

44. It is suggested that increasing intakes of complex carbohydrates has beneficial effects on human health by lowering saturated fat intake and improving insulin sensitivity. However, it is not known whether, or to what extent, their breakdown products in the digestive tract have an overall beneficial effect on human health, and whether some may be detrimental under certain circumstances.

45. The 1996 Review of the Nutrition R & D programmes concluded that no further work should be commissioned under this programme until results from all the on-going projects are available. *A new research programme on diet and colonic health is currently being developed and a competitive tender inviting proposals for support in this area in FY 1998/99 will be issued shortly.*

ANTIOXIDANTS IN FOOD (AN04)

INTRODUCTION

46. Oxidative free radical damage to DNA, fatty acids and proteins is believed to be causally involved in ageing and degenerative diseases such as cardiovascular disease, cancer, cataracts and perhaps immune system decline. An adequate dietary supply of antioxidant nutrients may help to reduce the likelihood of such diseases developing. In order to provide advice to the consumer, determination of optimum dietary intake levels is required.

47. The 1996 Review of MAFF Nutrition R&D concluded that future research in this area should concentrate on human intervention studies *in vivo* to examine the effects of different diets, by using validated biomarkers developed as potential intermediate predictors of disease end points. Considerable progress has been made in the development and validation of suitable biomarkers and it is envisaged that once this has been completed, proposals will be sought for projects to address specifically the question of the optimal amount of dietary antioxidants needed for health, using the biomarkers developed under this programme. It is hoped that the forthcoming EU Fifth Framework Programme will assist in this goal by offering UK scientists access to first-class international collaborations and funding.

STRATEGIC RESEARCH REQUIREMENTS

48. A considerable amount of research in the Antioxidants in Food Programme is devoted to the development and validation of biomarkers of oxidative damage to DNA. In addition, new research to be initiated in 1998 will start to "map" this damage *in vivo* to specific parts of the genome in order to assess the biological significance of the lesions being detected by the biomarkers. Proposals are invited to understand:

A. *(i) how the prevention of oxidative damage to certain identified genes can reduce the risk of disease and (ii) if such specific damage to sensitive sites on the genome can be correlated to broad biomarkers (e.g. lymphocyte levels of 8-OH-dG).*

49. The Ministry wishes to encourage UK participation in the forthcoming EU Fifth Framework Programme. It is recognised that a great deal of thought and discussion may be required to conceive and prepare applications for pan-European antioxidant intervention studies. Applications are invited from scientists with experience in the Antioxidants area and of European funding to:

B. *Co-ordinate a series of facilitated workshops to discuss the scope of future EU funded antioxidant studies and assist UK scientists in the preparation of Framework Five applications.*

FURTHER INFORMATION

50. For advice on specific scientific issues prospective contractors are advised to contact the Programme Adviser, Professor A T Diplock (Tel: 0171 955 4521, Fax: 0171 403 7195 in the first instance, or Tel/Fax: 01273 835548). For advice or information on the policy background/objectives of this programme please contact Mr S Wearne, Radiological Safety and Nutrition Division, MAFF (Tel: 0171 238 6750).

PLEASE READ CAREFULLY THE SECTION ENTITLED 'GUIDANCE FOR APPLICANTS' (PAGES 3-9) BEFORE SUBMITTING YOUR PROPOSAL.

OPTIMAL NUTRITION STATUS (AN05)

INTRODUCTION

51. The intake and bioavailability of micronutrients are important factors in maintaining good health. This programme aims to increase our understanding of micronutrient requirements, and in particular functional effects of micronutrients in humans. The results will contribute to the development of reference intakes for micronutrients and the formulation of dietary advice to the general public. Work in this programme complements the 'Antioxidants in Food' and 'Dietary Surveys and Nutrients' Programmes and contributes to the information requirements of the Committee on Medical Aspects of Food and Nutrition Policy (COMA).

52. To date, this MAFF funded research programme has concentrated on the determination of micronutrient intakes, bioavailability and functional markers of nutritional status. The Department of Health also funds research in this area although their primary focus has been the link between diet, nutritional status and health outcomes.

STRATEGIC RESEARCH REQUIREMENTS

53. Research in this on-going programme is yielding valuable information on micronutrient requirements, bioavailability and functional markers of nutritional status. This research is complemented by research funded through other agencies in the UK and elsewhere. To ensure that the results from these projects are used to their best effect, and to identify areas in which further research is still needed, it is important that the results of this programme are viewed in a wider scientific context. Proposals are therefore sought which will:

A. *Provide a critical overview of the research commissioned in the Optimal Nutrition Status Programme and place this research in the context of an ongoing international research effort.*

Organise and facilitate a series of small workshops with the aim of identifying and prioritising the further research required in order to inform Government policy on DRVs and refine dietary advice for the following nutrients:

Iron	*Selenium*
Folate/folic acid	*Vitamin K*
Vitamin C	*Copper*
Vitamin E	*Calcium*
Vitamin D	

Proposals should cover both of the above aspects and should involve the Ministry's Programme Adviser and scientific officials at all stages. It is envisaged that the work should take no more than nine months to complete.

FURTHER INFORMATION

54. Plans for a new expert group to look at the need for safety limits on the levels of vitamins and minerals in dietary supplements were announced on 18 December 1997. The new expert group's terms of reference will be to:

- establish principles on which controls for ensuring the safety of vitamin and mineral supplements sold under food law can be based;
- review the levels of individual vitamins and minerals associated with adverse effects;
- recommend maximum levels of vitamins and minerals in supplements if appropriate;
- report to the Food Advisory Committee (FAC).

The group will also be able to advise on the levels of vitamins and minerals in fortified foods, if it is considered appropriate.

55. The exact manner in which this work will be progressed has yet to be finalised. However, it is possible that it may generate further research requirements during the course of 1999.

56. Applicants are advised to consult the November/December (Number 6) 1997 issue of Nutrition and Food Science (MCB University Press) which contains an overview of this Programme.

57. For advice on specific scientific issues prospective contractors are advised to contact the Programme Adviser, Dr Margaret Ashwell (Tel/Fax: 01462 742166, Email: ashwell@compuserve.com).
For advice or information on the policy background/objectives of this programme please contact Miss Sue Oldreive, Nutrition Unit, MAFF (Tel: 0171-238-5344).

PLEASE READ CAREFULLY THE SECTION ENTITLED 'GUIDANCE FOR APPLICANTS' (PAGES 3-9) BEFORE SUBMITTING YOUR PROPOSAL.

FOOD AUTHENTICITY (AN06)

INTRODUCTION

59. Selling food which is not as it is described is misleading, and can defraud consumers. Misdescription can take many forms, from the wrong declaration of origin, or substitution of expensive ingredients by cheaper raw materials, to inaccurate quantitative declaration of ingredients. It is important that consumers and purchasers are protected from such fraud and there is fair competition in the market place. The development of accurate, reliable and cost-effective analytical methods enables Government, enforcement bodies (primarily the responsibility of Local Authorities) and industry to ensure that foods are described or labelled correctly. This programme supports the development, implementation and enforcement of composition and labelling requirements in UK, EC legislation and any international commitments.

STRATEGIC RESEARCH REQUIREMENTS

60. Research is required to develop robust methods, utilising novel technology where possible, to monitor the composition of foods and the accuracy of their labelling or description in the light of existing or likely future legislation in the following areas:

A. ***Adulteration of olive oil with hazelnut oil:*** *to enable detection of unrefined hazelnut oil in virgin and refined olive oils, and refined hazelnut oil in refined olive oil, which at present cannot be detected by existing methods.*

B. ***Adulteration of fruit juice with rectified concentrated grape or apple juice:*** *to find a marker in rectified concentrated fruit juices, which are potential adulterants, and which will permit its detection and quantification in fruit juice.*

C. ***Verifying the origin of plant or animal based foods and ingredients, especially if they have a specific geographical denomination or specific form of production:*** *this will address the problem of verifying specific labelling claims such as "organic" or "wild" and products of specific origin of high value such as meat products (e.g. Parma ham), cheese (e.g. Stilton, farmhouse Cheddar, etc.) and wines (most wines declare regional origin) by use of genetic or other markers to identify characteristic species or varieties of fruits, meat, dairy products etc. It is anticipated that projects will have joint European funding and/or co-operation.*

D. ***Accurate determination of non-muscle components of meat and poultry products:*** *this will address the quantitative declaration of meat content by using novel or existing technology to determine quantitatively offal, blood or skin in meat products in line with any changes in the definition of meat, which is under review.*

APPLIED RESEARCH REQUIREMENTS

61. Research is required to develop existing methodology to improve its usefulness when applied to authenticity problems by improving, simplifying or making it more rapid; or to improve the accurate quantification of ingredients in composite foods. Methods should be developed in such a way that they can be readily applied in other analytical laboratories. The following areas are of particular interest:

E. ***The improved quantification of animal based ingredients in compound products:*** *this is to address quantitative ingredient declaration (QUID). Protein and nitrogen analysis have been traditionally used for meat content determination. Improvement in these techniques is sought particularly by better immunoassays, or DNA based methods.*

F. ***The improved quantification of plant based ingredients in compound foods:*** *this is to address quantitative ingredient declaration (QUID). Quantification of plant based ingredients has been notoriously difficult relying on certain markers, and improvement is sought in any of the existing techniques.*

G. ***Differentiate, and if possible quantity, between different cuts of the same species of meat, and/or poultry, and from MRM, in raw and/or cooked products:*** *Are there ways of discriminating between, for example, pork shoulder and pork leg or loin, breast meat and thigh meat, or distinguishing quantitatively between hand deboned meat and MRM. DNA and immunoassays have a potential in this area.*

FURTHER INFORMATION

62. For advice or information on specific scientific issues or the policy background/objectives of this programme please contact Dr. Mark Woolfe, Food Labelling and Standards Division, MAFF (Tel: 0171 238 6168, Fax: 0171 238 6763, e-mail: m.l.woolfe@fscii.maff.gov.uk).

PLEASE READ CAREFULLY THE SECTION ENTITLED 'GUIDANCE FOR APPLICANTS' (PAGES 3-9) BEFORE SUBMITTING YOUR PROPOSAL.

DIETARY SURVEYS AND NUTRIENTS IN FOOD (AN08)

INTRODUCTION

63. Reliable and up-to-date information on the amounts of foods consumed by the population and the nutrient content of these foods is needed by Government. This need is met by undertaking dietary surveys, notably the National Food Survey, the National Diet and Nutrition Survey programme and the Total Diet Study, and an extensive programme of nutrient surveillance.

64. This R&D programme is intended to facilitate the monitoring, using the most appropriate scientific methodology within the budget available, of the amounts of foods consumed by the British population and the nutrient content of the British diet.

STRATEGIC RESEARCH REQUIREMENTS

65. There is increasing interest in the determination of folates in food, in particular the levels of added folic acid and individual naturally-occurring forms. MAFF has already funded some work in this area, which should be consulted before proposals are submitted. Further work is needed with the aim of developing and validating a routine HPLC method for use in the Ministry's nutrient surveillance programme. Such methodology should also be suitable for use by enforcement authorities and industry. Proposals are invited to:

A. *Develop and validate routine methodology for determining levels of added folic acid and naturally-occurring folate vitamers in foods.*

66. Food frequency questionnaires are widely used as a dietary assessment tool, particularly in nutrition epidemiology. However, they do have limitations and if not used appropriately may not yield the required information. Proposals are therefore invited to:

B. *Report on the design, validation, applicability and use of food frequency questionnaires as a dietary assessment tool. It is anticipated that this will include the organisation of a facilitated workshop.*

67. Dietary surveys may not give reliable information on rarely consumed foods (e.g. seasonal foods or foods consumed by a sub-population). However, these foods may be significant in terms of intake of nutrients or other food constituents in the population as a whole, or in specific sub-groups. There are a number of approaches that can be used to estimate the consumption of these foods from available dietary survey data. However, more direct measures of their consumption are needed. Proposals are therefore invited to:

C. *Review tools that might be used to assess the consumption of rarely consumed foods with a view to piloting one or more methods.*

APPLIED RESEARCH REQUIREMENTS

68. Composite or bulk samples are generally used for nutrient analyses undertaken as part of MAFF's nutrient surveillance programme in order to provide representative information in a cost-effective manner. This presents the challenge of ensuring that each composite sample is representative of the overall market for that product or commodity. Proposals are invited to:

D. *Review methods that might help ensure that composite samples analysed as part of the Ministry's nutrient surveillance programme are representative.*

69. There is always a need for development of tools for improving assessment of portion sizes in dietary surveys. A notable success has been the MAFF-funded development and publication of *A Photographic Atlas of Food Portion Sizes* for use when surveying adults. Tools suitable for use when surveying children are particularly needed. Proposals are invited to:

E. *Develop and validate tools to enable better quantification of portion sizes by children in dietary surveys.*

FURTHER INFORMATION

70. For advice on specific scientific issues, prospective contractors are advised to contact the Programme Adviser, Dr David Buss (Tel: 01252 622691; Fax: 01252 613374). For advice or information on the policy background/objectives of this programme, please contact Mrs Susan Church, Radiological Safety and Nutrition Division, MAFF (Tel: 0171 238 5764; Fax: 0171 238 5778). A short background note, giving further details of the requirements, is available for each area.

FOOD ACCEPTABILITY AND CHOICE (AN09)

INTRODUCTION.

71. Sensory and physiological reactions, psychological responses, economic, social, cultural and environmental considerations are amongst the factors that may influence the choices that people make about the food that they eat. Understanding and quantifying the strength of such influences will help to identify the emphasis that needs to be built into policy formulation in order to encourage the adoption of healthy, balanced diets by all sections of the population. It will also help health professionals and other influential groups to develop practical strategies which encourage dietary change at both individual and population levels. Intervention strategies developed and tested as part of research projects funded under this programme should be capable of effective application in real life situations. Therefore, it is particularly important that resource constraints are borne in mind.

STRATEGIC RESEARCH REQUIREMENTS

72. There is evidence that differences in socio-economic status as assessed by various means are associated with differences in health status. Those who, for instance, have low incomes or poor educational attainment have worse health experience, which can be partly attributed to nutritional factors. Much of the evidence about the quality of diets of those living on low incomes is anecdotal or based on cross sectional analyses of survey data. There is a need to examine causal pathways leading to poorer nutrition to provide information which can be used to identify courses of action to remedy food-related problems. There is some evidence to suggest that changes in income, either increases or decreases, result in changes in diet and that an increase in income per se may not necessarily lead to a healthier diet. Proposals are sought which:

A. *Determine the nature and extent of any modifications in dietary patterns and foods consumed brought about by alterations in economic circumstances, and the reasons for dietary change or lack of it. It is expected that researchers should seek to identify those who have just experienced a change in income or might do so in the near future, moving from either a low income into a higher income bracket or the reverse, and monitor dietary modifications for an extended period of time. In doing so they should take account of factors, affected by income, that may indirectly influence food choice, e.g. alteration in lifestyle patterns.*

73. There is concern that areas of relative exclusion from access to a wide range of reasonably priced foods, sometimes known as 'food deserts', where shopping facilities are scarce, lacking or far away and transport to shops unavailable or inadequate, are limiting the ability of people on low incomes to purchase a healthy, balanced diet.

B. *(i) Define the characteristics, and determine the location and extent, of 'food deserts'. In doing so researchers should apply themselves to both urban and rural areas.*
(ii) Suggest means by which the dietary limitations imposed by these areas can be overcome.
Proposals in area B. should cover (i) and may also cover (ii) above.

74. There is concern over increasing fatness in children, even in those of primary school age, reflecting the increase in adult obesity. Proposals are now sought which address the policy objective of reducing obesity in the adult population by addressing the avoidance of excess fatness in childhood.

C. *Develop an intervention strategy for the prevention of obesity development in primary school aged children. Proposals should encompass both dietary and physical activity components and be sensitive to the potential to aggravate eating disorders.*

75. A review and evaluation of research already carried out under the Food Acceptability and Choice Programme is at present in progress. Findings from this review may generate further research requirements during the course of 1999.

FURTHER INFORMATION.

76. For advice on specific scientific and policy issues, prospective contractors are advised to contact Dr Jenny Woolfe of MAFF Radiological Safety and Nutrition Division (Tel: 0171 238 6555, Fax: 0171 238 6330).

PLEASE READ CAREFULLY THE SECTION ENTITLED 'GUIDANCE FOR APPLICANTS' (PAGES 3-9) BEFORE SUBMITTING YOUR PROPOSAL.

IMPROVED METHODS OF ANALYSIS (AN07 & FS29)

INTRODUCTION

77. The development of new methods of analysis and sampling techniques are essential for the enforcement of food law under both UK and EU legislation. Research is needed to establish the accuracy, precision and suitability of new methods and to refine existing techniques. It is MAFF's strategy to make such methods available for use by industry and enforcement organisations to ensure that food safety can be complied with (in terms of both chemical and microbiological safety).

78. This research programme will be reviewed in 1998. This review will aim to clarify the policy needs for further R&D in this area, mechanisms for setting priorities for research and the use of results form research in the development and implementation of policy.

APPLIED RESEARCH REQUIREMENTS

79. Test materials are used in the assessment of analytical data, be it materials for collaborative trials, internal quality control or proficiency testing materials. For such materials to be effective it is essential that they are sufficiently homogeneous. Procedures for the evaluation of homogeneity and recommendations as to the standard of homogeneity need to be established and agreed. Proposals are invited to address the following:

A. *To develop rules and procedures for assessing the extent of homogeneity of test material.*

80. Recommendations on procedures for the preservation of official samples need to be developed, particularly with respect to the stability of frozen samples in food analysis, and the difficulty of preserving samples that may not be frozen for preservation. Proposals are invited to:

B. *Develop procedures for the preservation of official samples.*

81. There are requirements for quality factors in eggs prescribed in both EC and now UK legislation. Both microbiological and chemical procedures are needed to determine whether there is compliance with the requirements. The required microbiological methods have been validated and published by MAFF. However, there are a number of "chemical" determinations for which methodology recommendations are required to be developed and standardised. Amongst these are:

- the determination of some specific organic acids;
- the development and validation of a method of analysis for the determination of pasteurisation in eggs to replace the statutory α-amylase test (a recent collaborative trial has showed that the present statutory α-amylase test is unsatisfactory and a replacement needs to be developed;
- the development of a method of analysis for the determination of melange in egg products.

Proposals are invited to address the following:

C. *Development and validation of methods of analysis for the determination of prescribed quality factors in eggs.*

82. The conventional procedure for the determination of carbohydrates in a food is frequently "carbohydrates by difference". This approach is prone to an addition of errors effect. There is a need to develop an approach/analytical procedure to enable the direct determination of carbohydrates in food rather than the conventional indirect approach. The approach has been required in some fora, such as in Codex where a method/procedure for the direct determination of carbohydrates in infant formulae is required. Proposals are invited to:

D. *Develop an alternative validated method of analysis for the determination of carbohydrates in foodstuffs.*

FURTHER INFORMATION

83. For advice or information on specific scientific issues or the policy background/objectives of this programme please contact Dr Roger Wood, Food Labelling and Standards Division, MAFF (Tel: 01603 259350).

PLEASE READ CAREFULLY THE SECTION ENTITLED 'GUIDANCE FOR APPLICANTS' (PAGES 3-9) BEFORE SUBMITTING YOUR PROPOSAL.

FOOD SAFETY

CHEMICAL SAFETY OF FOOD

INTRODUCTION

84. The Ministry's research strategy on the safety of chemicals in food is designed to ensure that the levels of additives, contaminants and natural toxicants in food do not pose an unacceptable risk. The research is divided into programmes aimed at;

- the investigation of the nature and origin of chemicals in foods and the way that these may affect human health.
- research on improved methodologies for assessing the risks from chemicals in food
- research on the way the risks are managed with the aim of developing up to date and transparent risk management strategies.

NOVEL FOODS AND RELEASES OF GENETICALLY MODIFIED ORGANISMS INTO THE ENVIRONMENT (FS02)

INTRODUCTION

85. The EC Regulation on novel foods and novel food ingredients came into effect in 1997. This requires a statutory pre-market safety assessment to be carried out on foods and food ingredients which have not previously been consumed to any significant degree within the EU. In the UK, the Advisory Committee on Novel Foods and Processes (ACNFP) appraises data provided by applicants seeking safety clearance for their products.

86. Research under this programme is used to ensure that the safety assessment of novel foods reflects the most up to date scientific knowledge available. Such research is required to establish the nature of any potential problems, to develop appropriate, preferably generic, tests to assess any identified risks and to provide underlying knowledge which can be used to initiate development of production technology that will ensure product safety.

87. The programme will be reviewed in 1998.

88. Details of a related programme which considers safety in the agricultural environment from the release of genetically modified organisms (GMOs) may be found in the MAFF Research Strategy 1996-2000.

RESEARCH REQUIREMENTS

89. The use in plant breeding programmes of varieties of genetically modified (GM) crop plants that have been modified for different traits thereby producing a new variety with multiple traits, may require different safety considerations. It is important that these are identified at an early stage. Therefore, proposals are invited:

A. *To determine the food safety implications of the presence of multiple gene inserts ("gene stacking") on gene expression and cell metabolism in plants. This could include topics such as expression stability, the implication of changes in transgene markers brought about by propagation, interactions with mobile genetic elements and responses to environmental challenges such as stress and infection.*

90. There is a need to investigate the feasibility and practicality of carrying out monitoring to ensure the continued food safety of GMOs that have received approval under the Novel Foods Regulation as an additional safeguard to the existing arrangements for assessing the safety of these materials. As a starting point, an assessment needs to be made of the analytical techniques that could be used for these purposes.

B. *A comprehensive survey of the analytical techniques currently available and those under development which could be used for the long-term monitoring of the food safety of GMOs and their products.*

FURTHER INFORMATION

91. For advice on specific scientific issues prospective contractors are advised to contact the Programme Adviser, Mr K Cowey (Tel: 01483 773056)
For advice or information on the policy background/objectives of this programme please contact Ms Ranjini Rasaiah, Additives and Novel Foods Division, MAFF (Tel: 0171 238 5981; Fax: 0171 238 6382).

PLEASE READ CAREFULLY THE SECTION ENTITLED 'GUIDANCE FOR APPLICANTS' (PAGES 3-9) BEFORE SUBMITTING YOUR PROPOSAL.

FOOD ADDITIVES (FS16)

INTRODUCTION

92. There is a legal obligation for Member States of the European Union to establish systems to monitor the consumption and use of food additives, and report their findings to the European Commission. There is thus a requirement to develop suitable methods for the quantitative analysis of food additives in foods. The measurement of some additives can be relatively straightforward, but others present a problem for the analytical chemist. In particular there are considerable difficulties in identifying and quantifying additives which are complex mixtures and further research into suitable methods of analysis is required.

93. MAFF has carried out several research projects on additive-additive and additive-food interactions. In addition to continuing this research, there is a further need to develop methods for evaluating the toxicological significance of the results.

APPLIED RESEARCH REQUIREMENTS

94. Information is required on the interaction of food additives in general with each other and with food constituents, with the ultimate aim of developing a model system. Practical studies will be required to back up information gained from literature searches and proposals are therefore invited to address the following area:

A. *An investigation into the feasibility of using stable isotope labelling techniques to study additive interactions.*

95. When food additives are themselves natural substances it can be very difficult to analyse for them using conventional techniques. Methods therefore need to be developed using alternative technologies to enable monitoring and enforcement activities to be carried out. Work on developing such methods of analysis is required as follows:

B. *Development of antibody based methods for the detection of thaumatin in foodstuffs and for the detection of alginates, in the presence of other thickening agents in food.*

96. Monitoring the consumption of food additives is generally carried out using data from dietary surveys. This involves making a large number of assumptions about levels of additives in food and the type and amount of food people consume. One possible way of checking the validity of such assumptions is to use urinary biomarkers. Proposals are therefore invited to investigate:

C. *Assessment of the potential for developing urinary biomarkers for phosphates and benzoates.*

97. Analytical methods suitable for monitoring and enforcement purposes are required to determine the levels of food additives in foodstuffs. This will ultimately allow intake estimates to be carried out to determine the consumption of food additives and assist the assessment of their safety in use. Work on developing analytical methods is required as follows:

D. *Development of analytical methods for the determination of flavour enhancers in food stuffs.*

E. *Development of a method for the simultaneous determination of intense sweeteners in food.*

FURTHER INFORMATION

98. For advice on specific scientific issues or on the policy background/objectives of this programme please contact Dr W Matthews, MAFF, Additives and Novel Foods (Tel: 0171 238 6229).

PLEASE READ CAREFULLY THE SECTION ENTITLED 'GUIDANCE FOR APPLICANTS' (PAGES 3-9) BEFORE SUBMITTING YOUR PROPOSAL.

RISK ASSESSMENT (FS17)

INTRODUCTION

99. The hazard assessment of chemicals in food is normally carried out by extrapolating to man the results of classical toxicological studies on animals. There are however uncertainties in both the extrapolation to man of animal test results and the application of these results to the heterogeneous human population, added to which animal tests are expensive to carry out and are generally regarded as less desirable than alternative systems such as *in vitro* tests. There is a need therefore to investigate the use of alternative strategies for the risk assessment of chemicals in food.

100. The current approach to risk assessment of chemicals in food looks at chemicals in isolation and disregards any interaction the chemical might have with other food components or contaminants. However, it is now very clear that the interactions are important in determining the overall biological response to chemicals in food. Strategic research in this programme has focused on an approach which takes account of the fact the chemicals in food are not consumed separately but in the food matrix. As a result the assessment of the risk should, to be realistic, take into account the protective factors in the diet, endogenous processes, and genetic susceptibilities. A number of ongoing projects have focused on the chemoprotective effects of dietary components. The programme was reviewed in 1997 and a major conclusion was that the programme should, *inter alia*, investigate the mechanism of chemoprotection rather than simply the identification of chemoprotectants.

STRATEGIC RESEARCH REQUIREMENTS

101. The evidence from ongoing projects in the programme seems to show that the *in vivo* effect of individual genotoxic compounds can be modulated by protective factors in the diet. What is less clear, however, is how the biological effect of a particular genotoxic compound is affected by the presence of other genotoxic compounds in the diet i.e. the possible interaction between two or more genotoxins. These interactions might vary with dose and depend on whether they are between exogenous genotoxins or endogenous genotoxins. Proposals in this area should aim to provide mechanistic data to explain their experimental observations. It is hoped that information gained from this work could ultimately be used to consider the validity of the concept of threshold levels for genotoxic carcinogens.

A. *In what way do interactions between genotoxic chemicals in food influence their individual dose-response relationship?*

102. To carry out a risk assessment for a food chemical, regulators must be able to assess the level of exposure of a population group to a given chemical. To do this requires information on food intake and the level of a chemical found in the foodstuffs consumed. Combining the dietary information with information on residue levels in foodstuffs can give an indication of the intake of a particular chemical by a particular population group. This is routinely done by the Ministry using its large database of food intake and residue data and is the crudest model for estimating mean and "extreme" intakes of a wide range of chemicals in the diet by the UK population. However, what is less well understood is the true variability of these exposure assessments and **how they relate to individual consumers**.

There may be systematic errors that are present in the current approaches which the Ministry needs to be aware of. Further work on modelling approaches to combining the dietary and residue data in MAFF's possession to determine the exposure of individuals to chemicals in food in the UK is required which allow the systematic errors associated with each model to be assessed.

B. *What is the best way to model an individual's exposure to a particular chemical residue in food which gives an estimate of the 'true variability' using data obtained from the Ministry's food chemical surveillance programme and its food consumption surveys?*

FURTHER INFORMATION

103. For advice on specific scientific issues prospective contractors are advised to contact the Programme Adviser, Dr Diane Benford (Tel: 01483 259204).
For advice or information on the policy background/objectives of this programme please contact Dr Chris Fisher, Food Contaminants Division (Tel: 0171 238 6196).

PLEASE READ CAREFULLY THE SECTION ENTITLED 'GUIDANCE FOR APPLICANTS' (PAGES 3-9) BEFORE SUBMITTING YOUR PROPOSAL.

RISK MANAGEMENT (FS18)

INTRODUCTION

104. Consumer perceptions of food risks need to be taken into account when making risk management decisions about the control of food chemicals. At present, however, there are no formal systems for taking perceptions and other factors such as costs and benefits into account in policy formulation. This programme aims to assist the development of a better understanding of these factors, how they may be incorporated into risk management systems, and generally as a support for the development of frameworks for carrying out risk management of food. The overall aim is the development of approaches which ensure that food risk management policy is rational and transparent to all those with an interest in the safety of the food supply.

106. Much of the research required in this programme crosses the conventional boundaries between academic disciplines. Particular attention will be paid to proposals from multi-disciplinary teams involving collaboration between research organisations with complementary resource and expertise. Any group submitting a proposal for this project must include an academic with the relevant specialist background and an individual with a proven record in communicating scientific ideas effectively to the general public. Applicants should note that they will be expected to collaborate with health professionals and a number of other organisations.

107. This programme will be reviewed in 1998 and further requirements may emerge as a result of the review.

STRATEGIC RESEARCH REQUIREMENTS

108. Recent announcements about food risks have highlighted the importance of effective communication of the uncertainties associated with assessments of risk. The Ministry is interested in developing (i) better and more understandable ways of expressing scientific uncertainties and (ii) a sensible risk 'language' that can be used by officials and Ministers in communicating with the public. Effective risk communication will be particularly important for the new Food Standards Agency, especially as it is intended that its advice on risk issues will be made publicly available.

109. Uncertainties occur in both the hazard assessment and exposure assessment and in the way these are integrated in the final step of risk assessment, the risk characterisation. Uncertainties are inevitable in whatever risk management system a regulatory authority adopts, but they can cause confusion and undermine society's confidence in the risk assessment process.

A. *How can these uncertainties be effectively expressed as part of the risk characterisation?*

110. There is also a need to develop effective strategies and an understandable risk 'language' in outward communications about risk, and this will be particularly important for the Food Standards Agency in establishing its stance on risk issues and in building trust.

B. *What strategies and techniques are needed in developing outward risk communications on food safety, bearing in mind that this will be an important function of the new Food Standards Agency?*

FURTHER INFORMATION

111. For advice on specific scientific issues prospective contractors are advised to contact the Programme Adviser, Professor Glynis Breakwell (Tel: 01483 259175). For advice or information on the policy background/objectives of this programme please contact Dr Chris Fisher, Food Contaminants Division (Tel: 0171 238 6196).

PLEASE READ CAREFULLY THE SECTION ENTITLED 'GUIDANCE FOR APPLICANTS' (PAGES 3-9) BEFORE SUBMITTING YOUR PROPOSAL.

NATURAL CONSTITUENTS OF FOOD (FS20)

INTRODUCTION

112. Many foods contain naturally occurring chemicals which may have either a deleterious or behavioural effect on human health, either directly as in terms of toxicological or pharmacological effects or indirectly, by reduction of absorption of nutrients for example. MAFF commissions research in this field to assess overall safety risks, to explore ways of minimising such risks and to advise consumers on the nature of any risks from natural food constituents. Research is also needed to provide a scientific basis for setting regulations to protect consumers, for example the EU proposals to harmonise levels of mycotoxins in food.

113. Due to increasing interest in naturally oestrogenic substances in the diet, a new sub-programme on "Phytoestrogens in the Diet" has been created. The work on mycotoxins has also been separated out as a sub programme on "Mycotoxins in the Diet". The residual "Natural Constituents of Food" programme will focus on developing a "Whole Food Approach" to the assessment of risk from inherent natural toxicants.

STRATEGIC RESEARCH REQUIREMENTS

(a) Phytoestrogens in the Diet

114. There is increased interest in the use of diets high in phytoestrogens to help alleviate menopausal symptoms and to protect against osteoporosis. Indeed, food products are currently being marketed in the UK on the basis of their high levels of these compounds. MAFF has projects in place which are investigating the relationship between the intake of phytoestrogens and osteoporosis. However, there is comparatively little information available on the biological effect of increased phytoestrogen intake by menopausal women. This research on phytoestrogens should also lead to a better understanding of the significance of other endocrine disrupting chemicals present in food and the environment which are currently of widespread concern. Proposals are invited to:

A. *Assess the biological effects, beneficial or adverse, arising from the consumption of diets high in phytoestrogens in menopausal women.*

115. There is now a considerable body of evidence which suggests that susceptibility of specific population groups to many diseases is related to both environmental and genetic factors. In particular, some hormonally-related cancers may involve genetic polymorphisms which pre-dispose individuals to the disease. However, given that environmental factors are important in the aetiology of these conditions, modification of the diets of susceptible individuals may prevent the development of disease. MAFF is interested in seeking research proposals which will:

B. *Investigate the relationship between genetically susceptible groups in the population to hormonally related cancers and phytoestrogen intake.*

(b) A Whole Food Approach to Non-Nutrient Chemicals in Plant Foods

116. There are potentially a huge number of chemicals which theoretically can be isolated from plant foods and which can be shown to be toxic if tested in isolation. Various societies and cultures have evolved processing strategies for dealing with acute toxicity from chemicals in plant foods (boiling kidney beans before consumption). However, there is considerably less understanding when it comes to low level chronic exposure to plant toxins. There is little or no epidemiological evidence which suggest that consumption of fruit and vegetables has an adverse effect in humans. Indeed, the evidence is overwhelmingly in the other direction. However, from time to time there are concerns which do arise and it is important that the Ministry is able to assess the risk of a particular chemical found naturally in some plant foods.

Limited tenders to be advertised for work to start in 1998/99

MAFF has/will be issuing tenders for specific research in this area separately. Applications are not requested through this document but for information, the first tender covers:

Development of a decision scheme which would assist in setting priorities in this area of research and which allows for missing information, formalises the incorporation of intuitive judgements made by experts and reflects various types of uncertainty.

117. A workshop on the Whole Food Approach to non-nutrient chemicals in the diet was held in November 1997. The Report from the Workshop will lead to the identification of further research requirements. A separate tender for these requirements will be issued during 1998.

FURTHER INFORMATION

118. For advice on specific scientific issues in relation to phytoestrogens sub-programme prospective contractors are advised to contact the Programme Adviser, Dr Hugh Makin (Tel: 0171 377 7620). For advice on specific scientific issues in relation to mycotoxins or the whole food approach, prospective contractors are advised to contact the Programme Adviser, Dr David Lindsay. For advice or information on the policy background/objectives of this programme please contact Dr Caroline Tahourdin (phytoestrogens), Food Contaminants Division, MAFF (Tel: 0171 238 5334) or Ms Eileen Mortby (mycotoxins), Food Contaminants Division, MAFF (Tel: 0171 238 6222), (Fax: 0171 238 5331 for both).

PLEASE READ CAREFULLY THE SECTION ENTITLED 'GUIDANCE FOR APPLICANTS' (PAGES 3-9) BEFORE SUBMITTING YOUR PROPOSAL.

CHEMICAL CONTAMINANTS FROM FOOD PRODUCTION (FS21)

INTRODUCTION

119. This programme is aimed at investigating the nature and origin of the inorganic and organic environmental chemicals in food, which might be present naturally in the environment or released into the environment from various sources. The programme aims to develop (i) strategies for reducing contamination of foods; (ii) methods for measuring the uptake of contaminants by the human body; (iii) a model to determine the fate of contaminants in the food chain; and (iv) rapid methods for the measurement of contaminants in food in order to support MAFF's extensive programme of food surveillance. Priority inorganic contaminants are currently nitrate, cadmium and arsenic; priority organic contaminants are dioxins and PCBs.

120. As part of its long-term strategy, the Ministry hopes to develop collaborative research programmes with other Government Departments and Agencies on assessing the impact of contaminants released into the environment (with particular reference to the food chain) and developing strategies to ensure that the levels of contaminants in foods remain within tolerable levels. In addition, it is hoped that greater co-ordination of this programme with the research efforts of other EU Member States in this area can be achieved.

STRATEGIC RESEARCH REQUIREMENTS

121. Consumption of high levels of nitrate may have toxic consequences in humans. However, recent research has indicated that dietary nitrate may have beneficial effects on human health. As well as understanding the effects of dietary nitrate in humans, the extent to which dietary nitrate contributes to the concentration of nitrate in the body requires examination.

A. *To determine the relationship between nitrate intake in the diet and blood plasma concentrations of nitrate, and an assessment of the adverse effects in humans.*

122. The absolute concentrations of many chemical contaminants in food can be measured accurately and estimates of the extent to which they are consumed in the diet can be made. However, these chemicals are generally not completely absorbed from the diet and considerable quantities of the contaminants consumed can be excreted without having been absorbed. The proportion of contaminant absorbed, or its bioavailability, in humans is affected by a number of factors. In order to assess the potential threat to human health posed by such contaminants in the diet, an understanding of their bioavailability in humans is necessary.

B. *Determination of the bioavailability in humans of PAHs, phthalates and aromatic hydrocarbons when consumed as part of the diet.*

Limited tenders to be advertised for work to start in 1998/99

MAFF has/will be issuing tenders for specific research areas separately. Applications are not requested through this document but for information, the tenders cover:

A review of the current suite of models used by MAFF's Food Contaminants and Radiological Safety Divisions in order to identify critical data requirements and how they might be brought together within a common software platform.

Chemical contaminants in human milk: a pilot study to develop procedures for the establishment of an archive of human milk samples from the UK.

FURTHER INFORMATION

123. For advice on specific scientific issues prospective contractors are advised to contact the Programme Adviser, Dr Geoffrey Pigott (Tel: 01625 582779).
For advice or information on the policy background/objectives of this programme please contact Dr Nigel Harrison, MAFF Food Contaminants Division (Tel: 0171 238 6235).

PLEASE READ CAREFULLY THE SECTION ENTITLED 'GUIDANCE FOR APPLICANTS' (PAGES 3-9) BEFORE SUBMITTING YOUR PROPOSAL.

CHEMICAL CONTAMINANTS FROM MATERIALS AND ARTICLES IN CONTACT WITH FOOD OR DRINK (FS22)

INTRODUCTION

124. This research programme contributes directly to MAFF's responsibility to protect consumers, by ensuring that migration of substances into food and drink from materials or articles in contact with them, does not pose an unacceptable risk.

125. Since this work complements that being carried out in other EU countries to support regulation of chemicals in food contact materials, applications are encouraged for joint funding with other interested parties such as the European Commission.

APPLIED RESEARCH REQUIREMENTS

126. The use of unusual types of wood to manufacture food contact materials and articles, including decorative utensils, is becoming more common. The extent and conditions of use of these non-traditional woods in contact with food will be reviewed; and an assessment made of the potential for chemical migration from them into foods to see if there is a potential risk to health. Proposals are therefore invited for the:

A. *Collation and review of information on the use of new types of wood in food contact materials including decorative utensils and the potential for chemical migration into foods.*

127. It is generally assumed that the use of food contact materials, made from recycled paper and board, in contact with dry foods does not present a risk of chemical migration into foods. There is, however, some limited evidence of such migration. Research is required on a number of aspects: does migration take place into all or certain types of dry foods?; what kinds of substances migrate and at what levels?; if there is migration what is the likely source of the migrants and how can such migration be reduced?. Proposals are therefore invited for an :

B. *Investigation of migration into dry foods from packaging made from recycled paper and board.*

128. In recent years there has been an increase, in the UK, of the use of printing inks and related coatings (varnishes and lacquers) on packaging surfaces which can come into direct contact with food. These applications are primarily for promotional and marketing purposes. e.g. in confectionery and ice-cream wrappers, and on dry food packaging and inserts. The inks and coatings used consist of resins and various other substances like solvents and colourants. Research is needed on the constituents, and conditions of use, of these inks and related coatings; and any chemical migration into food should be investigated to see if there is a risk to health. Proposals are therefore invited for an :

C. *Investigation of the constituents of printing inks and related coatings used on packaging surfaces that can come into direct contact with food and the potential for the transfer of these constituents into foods.*

129. There are moves within Europe to improve risk assessment criteria to ensure that there are no disproportionate restrictions on food contact materials and articles. For example more refined exposure models are being researched to take account of food consumption and packaging use factors. To inform this ongoing debate research is needed on a strategy for better assessment of the risks to health from the chemicals used in the manufacture of food contact materials and articles, and their conditions of use. This might help define particular areas of concern to better target research or regulatory effort. Proposals are therefore invited to establish a :

D. *Strategy for the assessment of levels of risks to consumers from chemicals used in the manufacture of food contact materials and their conditions of use.*

FURTHER INFORMATION

130. For advice or information on specific scientific issues or the policy background/objectives of this programme please contact Mr Patrice Mongelard, Additives and Novel Foods Division, MAFF, (Tel: 0171 238 6225).

PLEASE READ CAREFULLY THE SECTION ENTITLED 'GUIDANCE FOR APPLICANTS' (PAGES 3-9) BEFORE SUBMITTING YOUR PROPOSAL.

FOOD INTOLERANCE (FS30)

INTRODUCTION

131. MAFF has funded R&D on food intolerance since the mid 1980s. Current research has three main objectives, namely

(i) the collection of data to support policy development on food labelling;
(ii) the development of a better understanding of the physiological basis of reported food intolerance reactions; and
(iii) the identification of steps that might be taken to reduce the incidence and severity of allergic reactions.

132. This programme will be reviewed in 1998 to ensure that the outputs from the research are in line with policy objectives.

STRATEGIC RESEARCH REQUIREMENTS

133. The natural history of peanut allergy is not well understood and is more complex than originally thought. For example, it seems that many children are allergic only to peanuts or other single nuts and there is little cross-reactivity. In contrast, adults nearly always show some cross reactivity. Work is required to investigate the differences in the reactivity of allergic individuals to nuts or peanuts and to explain the apparent differences between adults and children.

A. *Is there any basis for the apparent difference in reactivity to peanuts and nuts between young children and adults?*

FURTHER INFORMATION

134. For advice or information on the scientific and policy background/objectives of this programme please contact Dr Chris Fisher, Food Contaminants Division (Tel: 0171 238 6196).

PLEASE READ CAREFULLY THE SECTION ENTITLED 'GUIDANCE FOR APPLICANTS' (PAGES 3-9) BEFORE SUBMITTING YOUR PROPOSAL.

FOOD HYGIENE

INTRODUCTION

135. Food borne illness continues to be an issue in the UK and MAFF's microbiological research programmes aim to assist the food industry in its duty to produce safe food, to provide advice and guidance to enforcement authorities and consumers on how to ensure the microbiological safety of food, and to inform policy decisions. In late 1995 a Strategic Review of MAFF's microbiology R&D concluded that there was a need for better assessment and management of hazards and risks in relation to the provision of safe food. In order to achieve this, efforts have been made to better determine the needs of industry and how best to support the enforcement authorities' food safety role. In addition, the overall programme seeks to provide a balanced coverage from 'farm to fork' and to take proper account of the work commissioned by other funding bodies e.g. DH and BBSRC.

136. In 1996 a special emphasis programme on 'Assessing and Managing Hazards and Risks from *Campylobacter* spp. and *Salmonella* spp. in Poultry from Farm to Fork' was established. This follows the Advisory Committee on Microbiological Safety of Food (ACMSF) conclusions published in its 'Report on Poultry' that pathogen carriage rates can be substantially reduced by appropriate action and that application of HACCP principles is the key food safety management tool through which significant improvements can be made.

137. Unless otherwise specified, applications should focus on current foodborne pathogens of concern (e.g. *Salmonella, Campylobacter, Listeria monocytogenes* and Verocytotoxin-producing *Escherichia coli*), pathogens relevant to new processes (e.g. psychrotrophic *Bacillus* species), and toxin producing pathogens such as *Clostridium botulinum*.

DETECTION AND SEPARATION OF PATHOGENS AND THEIR TOXINS (FS12)

INTRODUCTION

138. The main objective of this programme is to improve methods for the detection of major food borne pathogens and their toxins so that they can be used by the food industry to inform food hazard management systems, to support enforcement authorities and to facilitate the identification and tracing of organisms causing illness.

STRATEGIC RESEARCH REQUIREMENTS

139. Other countries have had recent outbreaks of foodborne illness associated with fruit and vegetables where protozoa have been implicated. There is the possibility that similar outbreaks could occur within the UK, either with UK produced products or imports. There is a need to produce and validate a standard method for the detection of these organisms in fruit and vegetables. Such a method would be available for use in surveillance studies as well as during possible outbreaks associated with these organisms. Proposals are therefore invited for:

A. *The development and validation of a standard method which can be used to screen for the presence of protozoa (particularly cryptosporidium and cyclospora) on fruit and vegetables.*

140. There has been a significant amount of work undertaken on detection and characterisation methods for verocytotoxin producing *E. coli* O157. However, in comparison relatively little has been carried out on other VTEC serotypes. There is a need for an assessment of the currently available information and the production of a standard method which can be used to detect all VTECs in food. Proposals are therefore invited for:

B. *The development and validation of a standard method for detecting and characterising VTEC in foods. The method should be robust and suitable for use in surveillance programmes.*

141. There are numerous 'end-point' detection methods which can provide simple and rapid confirmation that a foodborne pathogen is present. However, they are all limited by the need to be presented with sufficient numbers of the target organisms. The Ministry has funded a significant amount of work to try and reduce the time required to achieve these numbers, with limited success. There is still a need to achieve this end and proposals are invited to address the following:

C. *Can the lead time required before microbiological cultures can be applied to standard detection systems such as PCR and immunoassays?*

142. It is well known that quantitative microbiological detection methods are not 100% accurate, with there being a tendency to underestimate the number of organisms present in a food. Similar problems occur with qualitative methods, with the proportion of detected positive samples in a batch likely to less than the proportion of actual positive samples. As results from the microbiological analyses of foods will form an important part of microbiological risk assessment it is essential to be able to make some assessment of how the inherent uncertainty in microbiological methods will affect the outcome of such assessments. Proposals are invited to address the following:

D. *Can the impact of the inherent uncertainty in microbiological detection and enumeration methods be determined with respect to the accuracy of microbiological risk assessments?*

FURTHER INFORMATION

143. For advice on specific scientific issues prospective contractors are advised to contact the Programme Adviser, Dr Chris Bell (Tel: 01483 418626)
For advice or information on the policy background/objectives of this programme please contact Dr Jonathan Back, MAFF Food Hygiene Division (Tel: 0171 238 6019, Fax: 0171 238 6745).

PLEASE READ CAREFULLY THE SECTION ENTITLED 'GUIDANCE FOR APPLICANTS' (PAGES 3-9) BEFORE SUBMITTING YOUR PROPOSAL.

ASSESSING MICROBIOLOGICAL HAZARDS AND RISKS (FS31)

INTRODUCTION

144. The objectives of this programme are to increase our understanding of how and where pathogenic micro-organisms enter the food chain, and to assess how specific food handling and production processes affect the survival, growth and toxin formation of micro-organisms in foods. This will allow Government and industry to assess objectively the hazards and risks from food-borne pathogens and assess the significance in consumer safety terms of changes in food production processes and the consumption habits of the UK population.

STRATEGIC RESEARCH REQUIREMENTS

145. An essential part of any risk assessment is understanding the extent to which a consumer is exposed to a specified hazard. Currently, there is little data available on the actual exposure of the UK population to specified microbiological hazards. By analogy with the methods used in chemical risk assessment, it is important to evaluate whether approaches can be developed to assess the exposure of consumers to microbiological hazards via food. A concept commonly used in assessing the human exposure to chemical contaminants in food is that of the "critical group". This concept entails the identification of specific sub-groups of the population who are more likely than others to be exposed to the particular contaminant. It may be of use to extend this concept to assessing exposure to foodborne pathogens. It is proposed that work in this area should focus on exposure to *Campylobacter* spp. or *Salmonella* spp. If this is successful, work could be extended to VTECs in subsequent studies. Proposals are invited to address the following:

A. *Can approaches be developed to determine the exposure of the population and of "critical groups" to foodborne pathogens, particularly Campylobacter spp. or Salmonella spp., over a specified period of time?*

146. It is important to determine the strains of foodborne pathogens that cause disease in man and to compare them with strains found in animals, food and the environment. This information will allow sources of infection in humans to be determined and routes of infection to be traced. Proposals are invited to address the following:

B. *A comparison of isolates of the major foodborne pathogens obtained from human infection, animals, food, and the environment.*

147. A considerable body of research has been completed and is under way in which the responses of foodborne pathogens to various stresses they may encounter during food production and processing are measured. In order to give a full picture of how individual organisms at the sub-species level react to a range of stresses, this information needs to be drawn together. A database of such baseline information would be valuable resource for assessing risks posed by these organisms. Any such database should only include data of high quality derived from research utilising approved, defined and reproducible experimental conditions. Proposals are invited to address the following:

C. *Development of a database of base-line information on the response of foodborne pathogens (including protozoa and viruses) to common stresses encountered in the food processing chain.*

148. There are variations in the patterns of reported foodborne illness in different countries. For example, not all countries have *Campylobacter* spp. as the most commonly reported cause of illness; *Salmonella enteritidis* may not always be more prevalent than other salmonella species; *E. coli* O157 is not the most commonly reported VTEC serotype, etc. Similar variation has also been reported from microbiological surveillance studies of animals, food and the environment. It should also be noted that there may be variations within countries with, for example, the cases of illness due to a specific pathogen being higher in certain areas. It is recognised that these variations may be due to differences in the way that countries collect data, however it is possible that they are linked to differences in food production processes or food sources. There is a need to investigate what causes these apparent variations and, if they are not due to differences in data collection, to understand what factors have led to particular organisms, species or strains causing more illness or being more prevalent in a specific country or area.

D. *An assessment of the world-wide infection and surveillance data available on foodborne pathogenic microorganisms with a view to identifying whether there are specific factors there lead to variations in prevalence between and within countries.*

FURTHER INFORMATION

149. For advice on specific scientific issues prospective contractors are advised to contact the Programme Adviser, Professor Bevan Moseley (Tel/Fax: 0118 9661675).
For advice or information on the policy background/objectives of this programme please contact Dr Jonathan Back, MAFF Food Hygiene Division (Tel: 0171 238 6019, Fax: 0171 238 6745).

PLEASE READ CAREFULLY THE SECTION ENTITLED 'GUIDANCE FOR APPLICANTS' (PAGES 3-9) BEFORE SUBMITTING YOUR PROPOSAL.

MANAGING MICROBIOLOGICAL HAZARDS AND RISKS (FS32)

INTRODUCTION

150. The primary objective of this programme is to provide information and techniques that will support the adoption of HACCP and related food safety management techniques. For the programme to be successful, the outputs will need to be in a suitable form that they can be picked up and applied by interested parties. These will include both industry, particularly SMEs, and the consumer. Although many of the outputs will be applicable to all parties, it is expected that on occasion there will be a need to provide information or techniques that meet specific needs. For example, work aimed only at the consumer or at a particular industry sector. When writing proposals, contractors are asked to make it clear to whom the work will relate.

151. This programme complements the element in the LINK programme on Advanced Hygienic Food Processing, which is concerned with hygiene assurance (see paragraphs 177 to 181).

STRATEGIC RESEARCH REQUIREMENTS

152. The Government, along with numerous other organisations, provides a considerable amount of information to consumers about ways in which they can prevent food poisoning in the home. How this information is used is unclear, although there are indications that consumers do not always follow the advice that is given. It would be of use to have sound scientific evidence to show that following such advice will lead to a reduction in the likelihood of contracting illness in the home. The outcome from this work will also be of use in helping to decide the most appropriate ways to promulgate food hygiene messages in the future. Proposals are invited to address the following.

A. *Can the effects that advice on food hygiene practices in the home have on food safety be assessed through a case controlled study using marker organisms*?

153. The effective implementation of HACCP within the food production industry is seen as the most effective way of improving microbiological food safety. Whilst the principles are the same whatever sector of industry is concerned, the degree of documentation and verification will differ widely according to the type of business. There will be benefits in determining how different parts of the food industry (especially SMEs) should approach these aspects of HACCP and, in particular, how the potential burdens of putting them in place can be minimised whilst still ensuring food safety. The outputs from the work would be used to help encourage industry to move toward full HACCP implementation and to ensure that the HACCP systems put in place were effective.

B. *An assessment of the level of documentation and degree of verification required to minimise the burden of HACCP on SMEs yet ensure microbiological food safety. A series of pilot studies are needed for different categories of SMEs in the food production and retail sectors.*

154. From time to time microorganisms not recognised as posing a threat to human health emerge as human pathogens. These are not isolated events and it is more than likely that as time goes on new pathogenic microorganisms will emerge. To maximise consumer safety it is important to be prepared for these events and to have management procedures available to enable action to be taken to either prevent or minimise human infection from these organisms.

C. *In the light of our experience with campylobacter, salmonella and E coli 0157 etc., what information would be required by regulators/risk managers on any hitherto unknown or emerging foodborne pathogen in order to devise effective management strategies?*

FURTHER INFORMATION

155. For advice on specific scientific issues prospective contractors are advised to contact the Programme Adviser, Dr Bob Mitchell, MAFF Food Hygiene Division (Tel: 0171 238 5705, Fax: 0171 238 6745). For advice or information on the policy background/objectives of this programme please contact Dr Jonathan Back, MAFF Food Hygiene Division (Tel: 0171 238 6019, Fax: 0171 238 6745).

PLEASE READ CAREFULLY THE SECTION ENTITLED 'GUIDANCE FOR APPLICANTS' (PAGES 3-9) BEFORE SUBMITTING YOUR PROPOSAL.

SPECIAL EMPHASIS PROGRAMME: ASSESSING AND MANAGING THE HAZARDS AND RISKS FROM *CAMPYLOBACTER* SPP. AND *SALMONELLA* SPP. IN POULTRY FROM FARM TO FORK (FS33)

156. The overall objective of the programme is to identify reliable and cost effective measures that can be used at all points in the food chain (from farm to fork) to eliminate *Campylobacter* spp. and *Salmonella* spp. from UK produced poultry and poultry products or reduce its prevalence to the lowest level possible. The programme provides an opportunity to apply approaches on the assessment of hazards and risks and the management of hazards and risks to a specific sector of the food industry.

157. A separate tender in this programme calling for a formal Risk Assessment for campylobacter and salmonella in poultry has been issued for support in financial year 1998/99 onwards.

158. Three research projects are already under way in the research programme. In addition to these there are a large number of related projects ongoing in MAFF's other microbiological food safety research programmes and within research programmes funded by other organisations. This represents a wealth of information on the organisms in question in the poultry production chain. This information needs to be drawn together and critically assessed in terms of its quality and the practical solutions which might be developed from an analysis of the data. As well as evaluating this wealth of historical data there are some clear requirements for additional work to answer specific questions relating to the interactions of campylobacter and salmonella with poultry in the production and processing chain.

STRATEGIC RESEARCH REQUIREMENTS

159. There is a limit to the amount of testing work which can be undertaken to determine levels and extent of microbial contamination in any food production process. In order to make the best use of a finite number of samples it is necessary to target the sampling programme. High throughput poultry production would benefit from an analysis of the validity of existing sampling plans and determination of how plans can be developed to provide the maximum useful information.

A. *To investigate the statistical validity of industry pathogen testing plans for salmonella and campylobacter, to determine how the best use can be made by industry of limited numbers of tests in high throughput production systems.*

160. In order to fully understand the chain of infection and contamination of salmonella and campylobacter in poultry, there is a need to assess their survival and viability during poultry production and processing.

B. *To determine the extent and duration of survival of campylobacter and salmonella across the full breadth of the poultry production and processing environment.*

161. There is evidence to show that the watering systems for poultry can be sources of foodborne pathogenic micro-organisms and hence can spread infection through poultry flocks.. Although methods are available for disinfecting these systems, there is a need to assess the relative efficacy of the different techniques in order to determine best practice and reduce the risk of infection.

C. *To investigate the utility, efficacy and safety of currently used and potential disinfection processes for water used in broiler production units.*

162. The scalding process which takes place prior to defeathering in poultry abattoirs is well known to spread contamination from single birds across a large number of others which may otherwise be uncontaminated. New approaches to this process need to be investigated to determine if any radical changes could be made which would prevent this cross contamination from occurring. For any system to be viable it would have to be cost effective for processing plants to operate and to fit easily within current processing systems.

D. *To determine whether there are alternative approaches to the prevention of contamination of poultry carcasses with micro-organisms during the scalding process, which might be used as critical controls in the scalding process in poultry abattoirs.*

163. Each of the above paragraphs represents a separate research area which can be addressed by an individual research project. Contractors may therefore wish to respond to one or more of these topics with individual research proposals. However, MAFF would particularly welcome proposals from individual laboratories or consortia of laboratories to conduct and manage a research programme covering all aspects of the research outlined above. Applicants wishing to respond in this way should ensure that they have access to a suitable range of expertise to address the wide range of issues listed above.

FURTHER INFORMATION

164. For advice on specific scientific issues prospective contractors are advised to contact the Programme Adviser, Dr Terry Roberts (Tel: 01189 566998).
For advice or information on the policy background/objectives of this programme please contact Dr Jonathan Back , MAFF Food Hygiene Division (Tel: 0171 238 6019, Fax: 0171 238 6745).

PLEASE READ CAREFULLY THE SECTION ENTITLED 'GUIDANCE FOR APPLICANTS' (PAGES 3-9) BEFORE SUBMITTING YOUR PROPOSAL.

OTHER FOOD HYGIENE RESEARCH AREAS

165. There are a number of other areas where the Ministry is likely to require research to be undertaken. However, it is not possible to specify research requirements in these at this time as information is awaited from expert committees and current research projects. When this is available a further call for food hygiene research will be undertaken. The areas of interest are:

- **Viruses**
- **Microbial antibiotic resistance**
- **The application of sewage sludge, animal slurry, and abattoir waste to land.**

Tenders in this area will be issued for work in FY1998/99 when the outcome of the deliberations of the expert groups are known.

MEAT HYGIENE

INTRODUCTION

166. The Meat Hygiene research programme is primarily directed towards protecting the public by promoting food safety. It is the intention that the outcome of any research is used where possible to provide a sound basis for government legislative requirements in support of public health purposes and to pursue amendments to EU hygiene legislation where necessary.

167. Meat hygiene research aims to improve understanding of microbiological hazards arising from the production of meat and to develop means of reducing the risks associated with them. The research falls into two parts: firstly, minimising microbiological contamination in processing plants through the development of HACCP controls, hygienic equipment design and methods for decontamination of meat and secondly, providing information on which to base a meat inspection system which will deliver the most effective protection of public health.

168. An important part of the MAFF strategy is to address and quantify the variety of biological hazards associated with fresh meat. The scientific evaluation of risks to public health is in line with the strategies for meat hygiene being developed in other countries, such as Australia, New Zealand and the United States. The codes of practice developed by the Codex Meat Hygiene Committee similarly entail a risk assessment approach to improving efficiency and enhancing food safety.

169. Following a recent review of meat hygiene research, the programme has been refocused to take account of the outcome and recommendations of that review with the objective of ensuring that the results ensuing from research will underpin current and future anticipated meat hygiene policy.

STRATEGIC RESEARCH REQUIREMENTS

170. The Pennington report has noted that contamination and cross-contamination are important factors contributing to food poisoning resulting from the consumption of meat and meat products. In particular the farm to abattoir phase of the production cycle has been highlighted as worthy of further investigation. To establish if alternative production /husbandry regimes can reduce particulate and bacterial contamination or cross-contamination of animals "on farm" and during transport to markets and abattoirs. In addition there is scope to examine abattoir procedures and equipment to establish if these can be modified to reduce or eliminate the spread of contamination between carcasses and throughout the abattoir environment. Research proposals are invited for:

A. *A study of the source and spread of contamination between animals "on farm", during transport to markets or abattoirs and at the abattoir, with particular reference to E. coli O157:H7, campylobacter and salmonella. The proposed studies should include intervention measures which can be integrated within a HACCP type programme covering the farm to abattoir phase of the production cycle.*

171. It is also acknowledged that any HACCP programme must be monitored effectively in order to provide assurance that the process is producing meat which is safe and wholesome. Whilst rapid microbiological methods are not used to monitor critical control points themselves, they can be central to any to any programme designed to monitor the effectiveness of processes at ensuring the necessary low levels of microbial contamination. It is not clear to

what extent technologies are available which are capable of supporting these monitoring needs. Proposals are therefore requested for:

B. *A review of rapid, real-time(line-side) analytical methods capable of providing rapid and practical methodology for routine monitoring of the ongoing effectiveness of HACCP plans in abattoirs and meat processing plants.*

FURTHER INFORMATION

172. For advice or information on specific scientific issues or the policy background/objectives of this programme please contact Dr Stephen Dixon, MAFF, Chief Scientist's Group (Tel: 0171 921 3896).

PLEASE READ CAREFULLY THE SECTION ENTITLED 'GUIDANCE FOR APPLICANTS' (PAGES 3-9) BEFORE SUBMITTING YOUR PROPOSAL.

FOOD AND DRINK MANUFACTURING AND DISTRIBUTION INDUSTRIES

INTRODUCTION

173. The following programmes are administered by the Food Technology Unit of MAFF Chief Scientist's Group, located in St Christopher House, Southwark Street, London SE1 0UD. Advice and more specific information on any of the programmes may be obtained from the contacts listed at the end of this section.

LINK INITIATIVES

174. LINK aims to accelerate the commercial exploitation of Government funded research and focuses on advances in science and engineering that have particular commercial promise. The initiative simulates collaboration between partners from industry and the research community to work together on projects in key scientific areas and assists the development of new products, processes and services.

175. LINK resources are concentrated in a series of programmes, each addressing a particular area of science and technology, and consisting of a portfolio of collaborative projects. Overall Government support is normally available at up to 50 % of total eligible project costs.

176. MAFF has supported three major LINK programmes in the food area, all of which are jointly funded with DTI and/or BBSRC. A new programme entitled *Eating, Food and Health* has just been launched and will also have MAFF support. The three programmes supported to date are:

ADVANCED AND HYGIENIC FOOD PROCESSING PROGRAMME

177. This programme was launched in 1994 and is actively seeking high quality project proposals.

178. There is a growing emphasis in food manufacture on hygienic processing and hygiene assurance. The food industry increasingly needs to employ advanced manufacturing techniques which allow greater process flexibility and minimisation of waste. This LINK programme encourages collaborative R&D that will strengthen these industries' technical base in hygienic manufacturing technologies, advanced manufacturing techniques and production flexibility.

179. The major research themes of the programme have been recently expanded to include aspects of food packaging technology. The programme now covers:

- Hygienic processing and hygiene assurance.
- Process simulation and modelling.
- Intelligent control strategies.
- Production flexibility.
- Advanced manufacturing systems.
- Food packaging technology.

180. The food packaging topic, which is new to the programme, is particularly intended to address the integration of packaging with new manufacturing techniques, packaging to improve or retain food quality and work to improve the recyclability of food packaging. Anyone intending to submit proposals under this area of research are advised to discuss their ideas with the Secretariat at an early stage.

181. Many of the topics listed require a multi-disciplinary approach and will involve academic groups with relevant expertise who have not previously collaborated with the food and/or biotechnology industries. Up to 20% of projects in AFM LINK can be in the area of technology transfer.

EATING, FOOD AND HEALTH PROGRAMME

182. There is a new LINK programme on the subject of 'Eating, Food and Health' which will continue with some of the themes from the earlier Agro-Food Quality Programme. The following research themes indicate a broad range of areas from which applicants to the programme will be able to select topics:

- Protective and beneficial effects of components to the diet.
- Physiological and psychological factors regulating appetite and energy balance.
- Health, innovation and risk.
- Understanding the factors determining food choice.

Further information may be obtained from the BBSRC contact, Dr Lesley Heppel on 01793 413200.

OTHER RELEVANT LINK INITIATIVES.

183. It may also be of interest to note that other LINK programmes offer opportunities of support for collaborative R&D relevant to the UK food industry. This includes the Sensors and Sensor Systems Programme which supports work on the commercial application and exploitation of a wide range of sensor technologies over a variety of industrial sectors. Information on this programme may be obtained from the EPSRC on 01799 540105.

STAND ALONE LINK PROJECTS

184. Stand alone LINK projects can also be funded if the subject matter is outside particular programmes but the collaboration in other ways meets the LINK criteria.

FURTHER INFORMATION

185. Further information on the Food LINK Programmes, including detailed programme descriptions, can be obtained from the MAFF Food Technology Unit (see paragraph 204). They will also be able to offer guidance on the mechanisms of project approval and advice on how to develop any initial ideas into a formal submission. In addition, they may also be able to assist in suggesting or locating suitable collaborative partners if it proves difficult to assemble appropriate academic and/or commercial groups.

186. Potential applicants should note that MAFF LINK programmes do not generally have cut off dates for submission of proposals. However, it is generally beneficial if submissions can be timed to the regular schedule of Programme Management Committee meetings. The MAFF Food Technology Unit will be able to advise on this.

BRIDGE-LINK

187. Barriers can sometimes arise to food industry uptake and exploitation of the results from publicly funded research, when the research is not sufficiently well developed to present an acceptable technical risk to potential collaborators. The Bridge-Link scheme provides funding for academic researchers, of up to 100%, for a limited period (maximum of one year) to enable research to be taken forward to a point where industry can share the risks and costs of further development under the normal LINK programme. Industry must expressly demonstrate a commitment to steer the research and at the end of the scheme, to make every effort to set up a shared cost project under LINK or the Teaching Company Scheme.

188. Potential applicants are advised to obtain a more detailed description of the scheme and its objectives from the MAFF Food Technology Unit, before preparing their submission. It is envisaged that the Bridge-Link scheme will providing funding for only a small number of projects in relation to the more wide scale LINK programmes.

EUREKA

189. This is a European wide programme which focuses on facilitating industrial collaboration and co-operation and provides a mechanism for creating new market opportunities throughout Europe. It is ideally suited for extending the marketing and technical skills of SMEs. The UK Government is committed to increasing the awareness of UK industry to the opportunities presented by EUREKA. Several European EUREKA offices are assisting in the development of specific initiatives in the agri-food section and MAFF are closely involved. Companies interested in the possibilities afforded by EUREKA should contact the MAFF Food Technology Unit for more information.

TEACHING COMPANY SCHEME

190. MAFF is providing substantial resources to the Teaching Company Directorate to increase the scope of this scheme to cover the needs of the food and drink manufacturing and distribution industries. Further information about the scheme, and details of how to apply for associateships can be obtained from:

The Teaching Company Directorate
Hillside House
79 London Street
Faringdon
Oxfordshire
SN7 8AA

Tel: 01367 242822, Fax: 01367 242831

191. Specific advice on the possibilities for the food and drink sector and further general information can also be obtained from the MAFF Food and Technology Unit.

TECHNOLOGY TRANSFER

200. During the past year MAFF has provided funding for a number of initiatives whose focus is on promoting the uptake of existing knowledge and skills by the food and drink industry. These include support for:

- Three regional Food Technology Transfer centres.
- A number of research and information clubs and a programme of seminars another activities promoting benchmarking in the UK food industry.
- The production of manuals of best industrial practice for small companies.
- A programme of workshops on new technologies and conferences to disseminate information arising from the food LINK programmes and related research.
- A technology demonstrator project.

201. MAFF also supports an Advanced Research Fellowship in Food Process Engineering at the University of Bristol. This is intended to constitute a centre of excellence for the food industry and is carrying out a programme of activities to evaluate new or existing technologies with potential application to the food sector.

202. A particular objective of the technology transfer programme is to raise the awareness and stimulate uptake of technologies which have been developed for other industrial sectors but which have potential applications for the food industry. Another objective is to enhance the technological base of small food manufacturing firms and to stimulate the spread of best practice throughout the food industry.

203. Further proposals are invited in the technology transfer area, although potential applicants should note that funding limitations mean that MAFF will need to be highly selective in deciding which proposals to support. Preference will be given to projects costing £30,000 or less in total. Individuals with ideas for relevant technology transfer activities (e.g. for new research or information clubs, spread of best practice projects, technology demonstrators or focused new technology awareness projects) are advised to discuss these with MAFF before submitting a formal application for funding. The MAFF Food Technology Unit will be able to provide advice on the suitability of the proposal and guidance on how to prepare the formal submission.

CONTACTS

204. MAFF Food Technology Unit Contacts:

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ANNEX 1- ABBREVIATIONS AND ACRONYMS

ACMSF	- Advisory Committee on Microbiological Safety of Food
ACNFP	- Advisory Committee on Novel Foods and Processes
ACRE	- Advisory Committee on Release into the Environment
AHG	- Animal Health Group
BAP	- Biologically Active Principle
BBSRC	- Biotechnology and Biological Sciences Research Council
COMA	- Committee on Medical Aspects of Food Policy
CSG	- Chief Scientist's Group
DH	- Department of Health
DRV	- Dietary Reference Value
DTI	- Department of Trade and Industry
EC	- European Commission
EPSRC	- Engineering and Physical Sciences Research Council
ESRC	- Economic and Social Research Council
EU	- European Union
FAC	- Food Advisory Committee
FDID	- Food and Drink Industry Division
JFSSG	- Joint Food Safety and Standards Group
GI	- Gastro-Intestinal (tract)
GM	- Genetically Modified
GMO	- Genetically Modified Organism
HACCP	- Hazard Analysis Critical Control Point
HPLC	- High Performance Liquid Chromatography
MRM	- Mechanically Recovered Meat
NDSD	- National Diet and Nutrition Survey
NFS	- National Food Survey
NSP	- Non Starch Polysaccharides
PAH	- Polycyclic Aromatic Hydrocarbon
PCR	- Polymerase Chain Reaction
PUFA	- Polyunsaturated Fatty Acid
ROAME	- Rationale Objectives Appraisal Monitoring Evaluation
RTD	- Research and Technological Development
SME	- Small or Medium-sized Enterprise
VTEC	- Verocytotoxin-producing *Escherichia coli*
WPFA	- Working Party on Food Authenticity

ROLE OF DIETARY LIPIDS IN THE DEVELOPMENT OF HEART DISEASE (AN02)				
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
AN0212	The effects of dietary fatty acids on cell proliferation and transformation *in vitro*	01/05/94	30/04/97	36,457
AN0213	The effect of specific fatty acids on immune cell activation: role of cellular lipids and eicosanoids	01/01/94	31/05/97	18,446
AN0216	The association of dietary fat intake with acquired genetic abnormalities in the colorectal mucosa	01/09/94	31/03/98	84,521
AN0217	The effect of triglyceride structure on lipid and lipoprotein metabolism	01/01/95	31/03/98	66,630
AN0218	Studies of the effects of structure of triacylglycerols on their absorption and metabolic disposition in man	01/10/94	30/06/97	31,067
AN0219	Influence of dietary fatty acids on procoagulant and fibrinlytic activities in humans	16/05/94	15/05/97	11,016
AN0220	Influence of dietary n-3 fatty acids on the requirement for vitamin E in humans	01/06/94	30/11/97	8,900
AN0221	Metabolism of dietary fat in relation to risk factors for coronary heart disease	01/11/94	31/12/97	88,771
AN0223	Effect of triglyceride structure on the gastrointestinal handling and metabolic fate of ingested dietary lipid	01/01/95	31/12/97	65,733
AN0226	Effects of specific dietary fatty acids on haemostatic factors in man	01/12/94	30/11/97	63,209
AN0228	Influence of increased dietary n-3 PUFA reduced SFA on the insulin sensitivity of postprandial macronutrient utilisation	01/07/95	31/12/98	103,254
AN0229	Trans fatty acids and the haemostatic function of the endothelium and platelets	01/05/95	30/04/98	61,577
AN0230	Dose response studies of dietary trans fatty acids on human lipoprotein metabolism - an investigation of mechanisms	01/06/95	31/05/98	195,717
AN0233	Evaluation of the effects of dietary supplements of individual fatty acids on vascular tone and endothelial	01/07/96	30/06/99	141,105
AN0234	Dietary fatty acids and endothelial functions in the control of vasomotor tone and nitric oxide metabolism	01/10/96	30/09/99	71,124
AN0238	The effect of dietary n-3 and n-6 polyunsaturated fatty acid intake on atheromatous plaque lipid composition	01/03/97	28/02/00	83,357
AN0239	Influence of n-3 PUFA intake on the expression of genes and cell surface molecules involved in endothelial inflammation	01/04/97	31/03/00	87,138
AN0240	Optimal intake of MUFAs in the UK diet and the mechanism of their effects on human lipoprotein structure and metabolism	01/04/97	30/09/00	89,112
AN0241	Effects of dietary substitution of saturated fatty acids with monounsaturated fatty acids	01/07/97	30/06/00	63,417
AN0243	Effect of diet on chain elongation and desaturation of alpha-linolenic acid in man	01/03/98	28/02/01	
AN0244	Importance of alpha-linolenic acid as a source of long-chain n-3 PUFA and its influence on risk factors of cardiovascular disease	01/06/98	31/05/01	

ROLE OF COMPLEX CARBOHYDRATES IN THE DIET (AN03)				
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
AN0305	Assimilation of glucose from different dietary starches: development and application of a new stable isotope approach	01/04/93	30/09/97	39,500
AN0308	The effect of food structure and polysaccharide composition on digestibility and colonic fermentation in vivo	01/09/94	31/03/98	154,370
AN0309	Complex carbohydrates and insulin sensitivity	01/01/95	31/12/97	86,131
AN0310	Effect of different dietary carbohydrates on colon function: Design of healthier foods	01/07/94	30/06/97	21,312
AN0311	Defining biomarkers of different carbohydrate intakes in populations with varying insulin sensitivity	01/07/95	31/12/98	47,710
AN0312	Development of normal adult human colonic primary epithelial cell cultures and cell strains and their growth regulation	01/08/95	31/07/97	19,878
AN0313	Effect of secondary bile acids and butyrate on the expression of c-myc and genes regulating apoptosis in colon epithelial cells	01/10/95	30/09/98	63,692
AN0316	Non-starch polysaccharide micronutrient interactions	01/07/97	30/06/00	14,456
AN0317	Cell proliferation and apoptosis in the human colonic mucosa - responses to dietary complex carbohydrates	01/09/97	31/08/00	37,864
AN0318	Assessment of micronutrient availability in long-term high and low non-starch polysaccharide consumers	01/07/97	30/06/99	23,482
AN0319	DNA replication in colonic mucosa monitored by the BUdR- Comet assay	01/10/97	30/09/00	23,184
AN0321	Measurement of blood plasma samples as part of non-starch polysaccharide (NSP) study with the University of Leeds	01/04/98	31/03/99	

ANTIOXIDANTS IN FOOD (AN04)				
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
AN0413	Dysfunction of vascular smooth muscle and endothelial cell oxide and prostacyclin production in inflammation	01/10/93	30/09/97	30,114
AN0422	The effects of phytoestrogens and antioxidants on cell proliferation genes in human breast tissue	01/08/95	31/07/98	71,437
AN0423	Isoprostanes: selective markers of peroxidation of different fatty acids in the human body	01/04/96	31/03/99	98,999
AN0424	Dietary antioxidants in prevention of tissue damage and changes in gene expression induced by UV free radicals	01/11/96	31/10/98	47,284
AN0425	Novel antibody based technology for studying the potential ameliorating effects of vitamin E and vitamin C on *in vivo*	01/04/96	31/03/99	109,572
AN0426	Development of a postlabelling assay as a biomonitor of oxidative DNA damage in humans and the modulating effects	01/07/96	30/06/97	39,637
AN0429	DNA damage and repair; relative responses to antioxidant nutrients in the diet and development of repair based	01/07/96	30/06/99	106,467

AN0430	Stress-induced gene expression in lymphoid cell: the influence of antioxidant supplementation	01/09/96	28/02/98	40,337
AN0432	Development of a postlabelling assay as a biomonitor of oxidative DNA damage in humans and the modulating effects	01/10/97	30/09/99	26,580
AN0433	Validation of biomarkers used to evaluate the extent of free radical damage to DNA in humans	01/01/97	31/12/98	114,495
AN0434	Biomarkers for *in vivo* oxidative damage to DNA: a validation study	01/04/97	31/03/99	76,690
AN0435	Development and validation of *in vivo* biomarkers of oxidative damage to proteins	01/04/97	30/06/00	85,702
AN0437	Antioxidants and the expression of genes in cells: The maintenance of health in vascular tissues and the heart	01/04/97	31/03/00	66,201
AN0438	Antioxidant nutrients and the cellular adaptation to oxidative stress in man	01/06/97	31/05/99	31,896
AN0439	Early markers of oxidative stress *in vivo* through identification of protein damage in circulating low density	01/10/97	30/09/99	11,996
AN0440	Biomarkers to free radical damage to blood proteins by peroxynitrite and hypochlorous acid: the use of specific	06/10/97	05/10/00	12,828
AN0442	Increased intakes of polyunsaturated fatty acids and vitamin E in relation to oxidative stress (formerly AN0225)	01/12/94	31/12/97	84,689
AN0443	Markers of oxidised LDL in relation to consumption of vitamin antioxidants and fatty acids (formerly AN0235)	01/06/96	31/05/98	42,027
AN0444	Dietary carotenoids in the protection against oxidative damage in humans (formerly AN0516)	01/07/95	31/12/97	93,906
AN0445	Dietary flavonoids and carotenoids; bioavailability and efficiency as antioxidants (formerly AN0518)	01/12/95	30/11/98	108,778
AN0446	Foods rich in dietary flavonoids and polyphenolic nutrients in the protection of oxidative damage (formerly AN0521)	01/09/95	31/08/98	86,663
AN0447	Influence of dietary flavonoids on oxidative damage in humans (formerly AN0522)	01/06/95	31/05/98	47,605
AN0448	Foods rich in dietary flavonoids and polyphenolic nutrients in protection against oxidative damage (formerly AN0523)	01/09/95	31/08/98	129,886
AN0450	Development and validation of a methodology for the detailed mapping of DNA damage induced by reactive oxygen species	01/05/98	30/04/01	
AN0451	The effect of antioxidant supplementation on P-selectin mediated monocyte atherogenic and thrombogenic potential	01/10/98	30/09/01	
AN0452	A consenus approach for the validation of methods of measuring *in vivo* oxidative DNA damage	01/09/98	31/12/01	
AN0453	Optimisation of antioxidant nutrient vitamins C and E using markers of *in vivo* oxidative DNA damage	01/04/98	31/03/01	
AN0454	Gamma-tocopherol: A stable isotope study examining its relationship to alpha-tocopherol, peroxynitrite and blood pressure regulation	01/07/98	30/06/01	
AN0455	An investigation into the effects of dietary vitamin C and E on *in vivo* adhesion molecule expression	01/10/98	30/09/01	
AN0456	A PCR based technique for cloning the sites of oxidative DNA damage and measuring the *in vivo* adhesion molecule expression	01/04/98	31/03/01	

OPTIMAL NUTRITION STATUS (AN05)				
PROJECT NO	TITLE	START DATE	END DATE	EST. COST 97/98 (£)
AN0504	Determining dietary vitamin K intake and food sources: seasonal variation and biochemical status	01/01/93	31/12/97	8,531
AN0508	Characterisation of the metabolism and utilisation of selected carotenoids	01/04/94	31/07/97	58,308
AN0509	Metabolic and adaptive response to different dietary intakes	01/04/94	31/12/98	70,024
AN0510	The effect of dietary sources of selenium on its absorption and metabolism in man	01/04/94	31/12/98	71,059
AN0511	The effect of copper supplementation on measures of lipoprotein oxidation and DNA oxidant damage	01/03/95	28/02/98	31,607
AN0512	Selenium intake: effect on selenoprotein function	01/10/94	30/09/97	46,876
AN0513	Does iron supplementation together with vitamin C supplementation enhance bioavailability of iron *in vivo*?	01/05/94	30/04/97	7,100
AN0514	The effect of dietary sources of selenium on its absorption and metabolism in man	01/04/94	31/12/98	47,000
AN0515	Metabolic and adaptive response to different dietary intakes of copper	01/04/94	31/12/98	27,000
AN0517	Relative potencies of individual carotenoids to inhibit human macrophage-mediated LDL oxidation and cytotoxicity	01/05/95	31/07/97	12,867
AN0525	Evaluation of the effects of a 2-year intervention with calcium and vitamins D and K on bone health in elderly women	01/05/97	30/04/00	106,181
AN0526	Dietary folate, homocysteine and endothelial function: A study of the interaction with methylene-tetrahydrofolate reductase genotype	01/05/97	30/04/00	52,111
AN0528	Bioavailability, pool size and turnover of vitamin C using stable isotopically-labelled vitamin	01/10/97	30/09/00	8,735
AN0532	Dietary factors protecting against osteoporosis in the seventh and eight decades of life	01/07/97	30/06/00	34,168
AN0533	Model systems, *in vitro* and *in vivo*, for predicting the bioavailability of lipid soluble components of food	01/11/97	31/12/00	69,597
AN0534	Dietary folate, homocysteine and endothelial function: the potential role of oxidative stress in vascular damage	01/10/97	30/06/00	15,500
AN0536	The use of deuterated tocopherol to study vitamin E metabolism in normal subjects (formerly AN0428)	01/04/96	31/03/99	110,582
AN0537	The use of deuterated tocopherol to study vitamin E/vitamin C/glutathione interrelations in human (formerly AN0436)	01/04/97	31/03/00	63,367
AN0538	Quantitative studies on the bioavailability of folates in food using isotope ratio mass spectrometry (formerly AN0827)	01/04/95	31/03/98	83,237
AN0539	Pilot study to develop the rare earth faecal marker technique for measuring bioavailability (formerly AN0831)	01/11/96	31/10/97	54,367
AN0540	Pilot study to develop the rare earth faecal marker technique for measuring bioavailability (formerly AN0832)	01/11/96	31/10/97	30,973
AN0541	Forms and bioavailability of iron in fortified cereal products (formerly AN0833)	01/04/96	31/03/98	39,771
AN0542	Forms and bioavailability of iron in fortified cereal products (formerly AN0834)	01/04/96	31/03/98	26,586
AN0543	Biochemical and molecular markers of functional selenium status in man	01/04/98	31/03/01	
AN0544	Speciation, bioavailability, biopotency and functional markers for D vitamers	01/05/98	30/04/99	
AN0545	Functional markers of selenium in man	01/04/98	31/03/01	

AN0546	Bioavailability of folic acid and natural folates: studies using the functional marker plasma homocysteine	01/06/98	30/11/01	
AN0548	The bioavailability of iron, zinc and copper in meat-containing and vegetarian diets in the UK	01/10/98	31/12/01	
AN0549	The bioavailability of iron, zinc and copper in meat-containing and vegetarian diets in the UK	01/01/99	31/12/01	
FOOD AUTHENTICITY AND ADULTERATION (AN06)				
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
AN0629	Development of spectroscopic and chemometric methods for the determination of the authenticity of fruit based products	01/09/94	31/08/97	16,999
AN0633	Assessment of food authenticity using pyrolysis mass spectrometry and neural networks: Application to olive oils	01/11/94	31/03/98	62,342
AN0641	Authentication of meat, poultry, fish and shellfish by Magnetic Resonance Imaging	01/07/95	30/09/97	38,131
AN0642	Detection of added sugar in fruit juices using carbon isotope ratios	01/04/95	31/08/97	9,475
AN0657	A novel method for the detection of MRM products by the identification of bone marrow specific DNA modifications	01/07/96	30/09/98	85,420
AN0659	Isotopic analysis as a means of assessing geographical origin of wine	01/04/96	31/03/98	63,796
AN0660	On line food authentication by visual identification of DNA marker	01/06/96	31/07/98	61,516
AN0663	Establishment of guidelines for the application of chemometric methods to food authenticity problems	01/04/96	31/07/98	43,396
AN0665	Authenticity of 'religiously slaughtered' meat	01/08/96	31/07/97	6,250
AN0666	The effect of season, ground, size, sex and moulting condition on the composition of *Nephrops norvegicus*	01/05/96	31/03/98	26,266
AN0667	Quantitative PCR detection of *T. aestivum* adulteration in commercial T. durum pasta using D-gas primers: optimisation	01/04/96	30/04/98	34,798
AN0670	The authentication of edible oils, including olive oil, on the basis of hydrocarbon conc and comp (formerly AN0656)	01/09/96	31/08/98	52,068
AN0671	Further development and evaluation of a method of detecting MRM in meat products by electrophoresis of cyanogen bromide peptides	01/05/97	30/04/98	28,504
AN0672	Validation of molecular assays for fruit juice authentication	01/04/97	31/03/99	92,719
AN0673	Improved methodology for the identification of non-cocoa fats in chocolate	01/04/97	31/03/98	62,162
AN0674	The immunological determination of meat content	01/05/97	31/10/98	26,255
AN0675	Evaluation of a DNA Method for meat species Identification	01/04/97	31/03/98	43,404
AN0676	The development of isotopic analysis and DNA polymorphic markers to determine the geographical and cultivar origin of premium long grain rice	01/05/97	30/04/99	62,617
AN0677	Development of a new method for the accurate measurement of added glaze on frozen foods, particularly shellfish	01/04/97	31/10/97	47,563
AN0678	New approaches to determining the geographic origin of wines	01/04/97	31/03/99	60,000
AN0680	Development and validation of immunochemical methods for the detection of MRM in meat products	01/04/97	31/03/99	29,662

AN0681	A novel method for the detection of neuronal tissue from beef by the identification of tissue specific DNA modifications	01/04/97	30/09/98	52,108
AN0682	Reviewing nitrogen factors for use in determining chickenmeat of chicken products	01/10/97	30/09/98	12,500
AN0683	Exploitation of the genetic variability in natural yeast populations to determine the geographical origin of wine	06/01/98	05/01/99	
AN0684	An investigation into methods which can determine the geographical and botanical origin of honey	01/04/98	31/03/99	
AN0685	Detection of meat species in fresh and processed food: Production and use of monoclonal antibodies reactive with the insoluble muscle protein desmin	01/05/98	30/04/00	
AN0686	Differentiation of species of meat in particular cooked products by DNA methods	01/04/98	30/09/99	
AN0687	Species identification of raw and heat processed fish from computer data bases of electrophoretic protein profiles	01/04/98	31/03/00	
AN0688	Use of accelerator mass spectrometry for determining the age of alcoholic beverages	01/04/98	31/03/99	
AN0689	Speciation of processed meat and fish products based on the actin multigene family	01/04/98	31/03/00	
AN0690	Identification of species in processed/composite fish/ seafood products using DNA-based techniques	01/04/98	31/03/01	
AN0691	A molecular approach for the identification of fruit pulps in food products	01/04/98	31/03/99	
AN0692	The development of a rapid and cost efficient assay for non-permitted cellulases in fruit juice	01/04/98	31/03/00	
AN0693	Development of a methodology for the identification of bottled waters that have been treated with ozone	01/04/98	31/03/99	
AN0694	Evaluation of a suite of methods to distinguish cheese analogues from genuine cheese	01/04/98	31/03/99	
MF0128	PISCES (Pattern Identification of Species by Computer Enabling Sorting)	01/04/94	31/03/96	

DIETARY SURVEYS AND FOOD COMPOSITION (AN08)

PROJECT NO	TITLE	START DATE	END DATE	EST. COST 97/98 (£)
AN0801	Total diet study	01/04/91	31/03/98	47,512
AN0816	Improved methods of dietary assessment	01/08/94	31/07/97	14,987
AN0835	Detecting and modelling mis-reporting of food intake with special reference to underreporting in the obese	01/10/97	31/03/01	24,096
AN0836	Vitamin B6 improvements in extraction and determination - Resolving inaccuracy and bias from its measurement	01/04/97	31/03/98	51,000
AN0837	Development and validation of 2 analytical procedures for the quantitative determination of fatty acids according to	01/04/97	31/03/98	39,000
AN0840	Major dietary factors that affect the micronutrient status of older people (formerly AN0527)	01/05/97	31/12/97	9,000
AN0841	Major dietary factors that affect the micronutrient status of older people (formerly AN0529)	09/06/97	08/06/98	18,622
AN0842	Diet and Micronutrient Status: Identifying groups within the elderly British population who consume micronutrient poor diets (formerly AN0530)	26/08/97	26/06/98	15,821
AN0843	How can we identify older people 'at risk' of low micronutrient intake and marginal micronutrient status? Development and validation of an assessment tool (formerly AN0531)	01/07/97	31/07/98	14,500
AN0844	A review of the NDNS survey of children aged 1.5 to 4.5 yrs to examine intakes and nutritional status of Fe, Zn and vit A	01/07/98	30/06/99	

AN0845	Total diet study	01/01/98	31/12/00	
AN0846	Food wastage pilot survey	01/04/98	28/02/99	
AN0847	Total diet study	01/04/98	31/12/02	
AN0848	The effects of micronutrient interactions on iron status using the NDNS survey of children	01/04/98	31/03/99	
AN0849	Further studies on the determination of heme & non-heme iron	01/04/98	31/03/99	
FOOD ACCEPTABILITY AND CHOICE (AN09)				
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
AN0906	Nutritional implications of food choice in catering outlets	01/11/94	31/10/97	88,970
AN0907	Health and Diet: the construction of food choice in later life	01/10/94	30/09/97	28,408
AN0908	The satiating properties of reduced-fat foods	01/05/94	30/04/97	4,122
AN0910	Communication strategies of the effective promotion of dietary change	01/04/94	31/03/97	41,649
AN0914	Fat and other food components in physiological and sensory satiety	21/11/94	20/11/97	33,587
AN0917	Why do women eat 'health foods' and supplements? Psychological and social influences	01/07/96	31/03/98	33,733
AN0918	Parents, peers and adverts; the home based interplay of influences on adolescents dietary habits and attitudes	01/01/97	31/12/98	26,640
AN0921	Development of self-assessments for intake of fat and other nutrients	01/10/96	30/04/99	22,347
AN0925	A family-based study to determine the acceptability of an increased intake of complex carbohydrates and to explore	01/09/97	28/02/01	48,417
AN0927	Technical economic and consumer barriers to the consumption of reduced fat bakery products	01/04/98	31/03/99	
AN0928	Barriers to the development and uptake of reduced fat foods	01/04/98	30/09/00	
AN0929	The development and evaluation of a novel school based intervention to increase fruit and veg intake in children	01/12/98	30/11/00	
AN0930	Food acceptability and choice - research into practice	01/04/98	31/03/99	
AN0931	Television and food choice (extension of AN0913)	01/02/98	31/01/99	
THE SAFETY OF NOVEL FOODS				
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
FS0202	Development of new methods for safety evaluation of transgenic crops	01/07/94	30/06/97	17,165
FS0204	Genetically modified organisms in food: Evaluation of *in vitro* and *in vivo* models for assessing DNA transfer in the gut	01/06/95	31/03/98	87,678
FS0205	Detection of genetically modified organisms in foods	01/04/95	31/03/98	33,243
FS0207	Potential for gene transfer between manipulated bacteria and the resident microflora of the human gut	01/06/95	31/05/98	79,940
FS0211	Regulation and targeting of transgene expression in fruit crops	01/11/97	31/10/00	14,210
FS0212	Causes of instability in transgenic plants	01/09/96	31/08/99	72,008
FS0213	Safety of recombinant DNA technology: gene location, marker elimination and secondary effect	01/10/96	30/09/99	102,589
FS0215	Compilation of a database of oil compositions from new varieties of oilseeds	01/09/96	31/08/97	7,238

FS0216	A database of novel foods and food products cleared in countries other than the UK	25/06/96	24/06/97	7,859
FS0217	Genes that have been introduced by genetic modification into crop plants intended for food use	26/06/96	24/06/97	7,510
FS0219	Persistence and potential infectivity of live bacteria in foods	01/05/97	30/04/99	72,497
FS0221	Development of a strategy to promote the public's understanding of biotechnology	01/04/97	31/03/98	110,068
FS0222	The effect of agriculturally-relevant environmental factors on the expression and stability of genes affecting wheat lip	01/07/97	31/12/00	20,956
FS0224	Survival of DNA in the gut and the potential for genetic transformation of resident bacteria	01/06/98	31/05/01	
FS0225	Evaluating the risks associated with using GMOs in human foods	01/09/98	31/08/01	
FS0226	Impact of transformation methods, construct and gene cassette architecture on the stability and expression of transgenes	01/04/98	31/03/01	
FS0227	Assessment of the risks of transferring antibiotic resistance determinants from transgenic plants to microorganisms	01/01/98	31/12/01	
FS0228	Dissemination of GM DNA and antibiotic resistance genes via rumen microorganisms	01/06/98	31/05/01	
FS0229	Risk of gene transfer from genetically modified crop plants to gut bacteria	01/04/98	31/03/01	
RG0108	Risk assessment of genetically engineered avian probiotics	01/11/94	19/07/98	23,518
RG0211	The effect of background genotype on transgenes	07/07/95	06/07/99	69,519
RG0214	Mobile genetic elements and lateral gene transfer events in crop species	01/06/96	31/05/99	50,697
	PREDICTIVE MODELLING OF GROWTH OF MICROORGANISMS (FS09)			
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
FS0927	Production and validation of Clostridium botulinum growth models for Food MicroModel	01/04/96	30/09/97	43,285
	HYGIENIC FOOD PROCESSING			
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
FS1033	Laser sterilisation for control of microbial growth in the food industry	01/10/94	30/09/97	40,191
FS1043	Decontamination using condensation under modified pressure and organic acids	01/07/96	30/06/98	90,933
FS1044	The novel use of excimer lamps to sterilise food and food processing surfaces	01/04/96	31/03/98	30,826
FS1046	Risk Assessment for Microbial contamination Hazards: A Network Approach	01/04/96	31/03/98	54,533
FS1047	The development of new 'slippery surface' materials to prevent biofilm establishment during food manufacture and processing	01/06/96	31/05/99	96,928
FS1050	Evaluation of Barriers to Usage of Food hygiene Management systems throughout the UK food industry	01/09/96	31/08/99	37,461
FS1051	The use of HACCP to ensure customer confidence in small scale farmhouse cheese manufacture and distribution	01/06/96	31/05/98	10,887
FS1052	*Campylobacter* spp. traced through poultry processing using conventional, molecular and a conductance typing technique	01/09/96	31/08/97	26,625
FS1054	The novel use of excimer lamps to sterilise food and food processing surfaces (formerly FS1045)	01/09/96	31/03/98	

DETECTION OF FOOD PATHOGENS AND THEIR TOXINS (FS12)				
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
FS1222	Pathogenic *Yersinia enterocolitica*; immunoconcentration and detection in foods	01/09/94	31/08/97	25,142
FS1223	A method for detecting *Cryptosporidium parvum* oocysts and *Giardia duodenalis* cysts in natural mineral waters	01/05/95	31/05/98	62,570
FS1231	Molecular and immunological approaches to the separation, concentration and detection of VTEC including *E.coli* 0157	01/01/96	31/12/98	90,860
FS1235	Development of methods for the detection of viruses in foods	01/04/95	31/03/98	196,407
FS1237	Vapour phase detection of hazards for food processes and distributed packages made sensitive and specific	01/10/95	30/09/97	26,890
FS1238	Development of improved methods for typing of vero cytotoxin producing *E.coli* (VTEC) 0157 and other serogroups, from food	04/09/95	03/09/98	56,298
FS1242	Rapid detection, quantification and molecular characterisation of thermophilic *Campylobacters* in foodstuffs and related environments	01/09/96	31/08/99	41,308
FS1243	Development of amplified immunoassays employing blood coagulation and novel microsphere labelling techniques	01/04/96	31/03/99	159,253
FS1244	Real time test for the specific detection of pathogenic microorganisms	01/10/96	30/09/98	73,629
FS1245	Sono-chemical signal development as a novel generic methods for the rapid, *in situ* and specific detection of low levels of food hazards at line	01/07/96	30/06/99	113,306
FS1248	Validation of methods for the detection of *E.coli* 0157:H7 in foods	01/07/96	31/05/97	24,418
FS1249	Development of assays for *Clostridium botulinum* toxins in food	01/04/96	31/03/99	238,627
FS1254	Validation of improved detection methods for the detection of thermotolerant *Campylobacter*	01/04/97	31/03/98	84,950
FS1256	Investigation of PCR methods for *Mycobacterium paratuberculosis* in milk	01/11/96	30/04/97	40,555
FS1258	Review of microbiological methods in the food industry	01/04/98	30/09/99	
FS1260	Preparation of 'validation samples' for use in the evaluation of microbiological methods for the examination of foods	01/04/98	31/01/00	
FS1261	The detection of *Clostridium botulinum* spores	01/04/98	31/03/99	
FS1262	Development and validation of rapid viable pathogen testing and enumeration by a simple and low cost new method	24/11/97	23/08/98	17,519
SEPARATION AND CONCENTRATION OF PATHOGENIC MICROORGANISMS (FS13)				
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
FS1316	The direct application of the polymerase chain reaction to foods	01/04/94	02/06/97	26,500
FS1318	Development of Chromatographic Techniques to Separate and Concentrate pathogenic microorganisms from Food	01/06/96	30/09/97	37,689

FS1319	Development of a novel bacterial trap to capture and concentrate low numbers of microorganisms from large volumes of food	01/04/96	31/03/98	144,247
GROWTH CONDITIONS FOR PATHOGENS (FS15)				
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
FS1524	The role of Physiological Factors in the Regulation of Toxin Production by *Staphylococcus aureus*	01/04/95	31/03/98	49,127
FS1525	Recovery of full viability in dormant cells of *Campylobacter*	01/02/95	31/03/98	85,567
FS1526	Investigation of the Physiological Mechanisms for the Adaptation of *Campylobacters* to Stress Injury	01/04/95	31/03/98	47,850
FS1527	Role of natural food constituents (cholines and peptone) in the growth, survival and reseuscitation by pathogenic bacteria in food	01/08/95	05/02/99	39,147
FS1529	Development of gene reporters to aid in the analysis of the physiological factors which affect botulinum toxin product	01/05/96	30/04/99	57,047
FS1530	Factors controlling toxin formation by *Bacillus cereus* and other psychrotrophic *Bacillus* spp	01/10/96	30/09/99	45,912
FS1531	Mechanisms of microbial resistance to high hydrostatic pressure	01/04/96	30/06/99	122,634
FS1532	Characterisations of bacterial membrane damage associated with electric field and high pressure treatment	01/09/96	31/08/99	143,489
FS1534	Metabolic capacity and viability of injured cell surviving novel foods preservation methods	01/04/96	30/06/99	107,578
FS1535	Mechanism of acid resistance of enterohaemorrhagic *Escherichia coli* 0157:H7	01/04/96	30/09/98	115,845
ASSESSING MICROBIOLOGICAL HAZARDS AND RISKS (FS31)				
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
FS3101	Physiological and microstructural factors controlling the survival and lag of food borne pathogens	01/04/97	31/03/00	110,864
FS3103	The evaluation and control of biofilm of significance to the food industry	01/09/97	28/02/99	16,631
FS3104	Characterisation of the non-linear thermal inactivation kinetics observed with *mycobacterium paratuberculosis* in food	01/11/96	31/03/98	71,256
FS3106	Workshop on antibiotic resistance in the food chain	30/07/97	31/01/98	68,094
FS3107	Variations in the virulence of *Campylobacter jejuni* strains associated with poultry and poultry meat	01/04/98	31/03/01	
FS3108	Why do bugs stick to what they stick to?	01/04/98	31/03/00	
FS3109	Development and study of tests to differentiate between tolerant and sensitive isolates of *Salmonella* and *E. coli*	01/04/98	31/03/01	
FS3110	Post stress detection of cold and hypochlorite stress proteins in *Salmonella typhimurium*	01/04/98	31/03/01	
FS3111	An assessment of population changes in *Salmonella enteritidis* and the emergence of strains with altered properties during food processing	01/04/98	31/03/01	
FS3112	Evaluation of the risk of induction and selection of more stress tolerant and virulent *Salmonellas* by exposure to food production-related stress	01/04/98	30/09/00	

MANAGING MICROBIOLOGICAL HAZARDS AND RISKS (FS32)				
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
FS3202	Thermal death of pathogenic microorganisms in real foods	01/05/97	30/04/00	83,947
FS3203	Barriers to the adoption of good hygiene practice by small and medium-sized food manufacturers	01/10/97	30/09/99	18,434
FS3204	An evaluation of food handlers knowledge, beliefs and attitudes about food safety and its interpretation using social cognition models	01/03/98	28/02/01	
FS3205	Development of a user friendly software package to enable a food company to design a safe food process	01/04/97	31/03/99	187,931
FS3206	Efficacy testing of disinfectants used in the food industry against a range of pathogens including *E. coli* 0157	01/05/98	31/10/99	
FS3207	Pathogen removal from food raw materials using ultrasonic water jets and water recycling by use of self cleaning filters	01/04/98	31/03/01	
FS3208	Novel techniques for cleaning and decontaminating raw vegetables and fruit	01/04/98	31/03/00	
FS3209	Cold Jet - A novel technique for cleaning and decontaminating food processing areas, equipment and food	01/04/98	31/03/00	
HAZARDS AND RISKS FROM SALMONELLA AND CAMPYLOBACTER IN POULTRY FROM FARM TO FORK (FS33)				
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
FS3301	Field studies to identify and evaluate key intervention points for *Salmonella* control during Broiler production	01/07/97	30/06/00	33,698
FS3302	Risk factors of cross infection by *Salmonellae* in supermarkets	01/04/98	31/03/99	
FS3303	The molecular epidemiology of *Campylobacters* in poultry and poultry meat and use to develop intervention strategies	01/04/97	31/03/00	56,094
FOOD ADDITIVES (FS16)				
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
FS1620	Food colorant analysis: characterisation of caramel colours I and IV and discrimination of malts from malt extracts	01/10/94	06/03/98	33,614
FS1627	Identification of the causative agents responsible for mineral hydrocarbon toxicity, with a view to describing	20/11/95	31/05/97	11,894
FS1632	Development of an immunoassay for Gum Arabic (*Acacia senegal*)	01/07/95	31/03/99	71,426
FS1637	Validation of methodology for the determination of organic solvents in foodstuffs	01/09/96	31/03/98	57,000
FS1638	Identification of fatty acid adducts of BHA and BHT	25/07/96	24/07/97	20,223
FS1639	Novel approaches to the identification and quantification of type III and type IV caramels in food	01/06/97	31/05/00	54,580
FS1640	Urinary biomarkers for selected food colours: extension to FS1631	01/06/97	30/09/98	86,000

FS1641	Development and validation of sensitive methods for the analysis of 3-monochloropropandiol (3-MCPD) in hydrolysed	01/12/96	31/03/98	49,203
FS1642	Dietary determinants of sulphide production in the human large intestine	01/10/97	30/09/99	10,750
FS1643	Urinary biomarkers for assessing caffeine intake	01/04/97	31/03/00	92,530
FS1644	Development and validation of a solid-phase microextraction method for the determination of coumarin, pulegone and safrole in foods	01/04/98	31/03/99	
FS1645	A literature review used as a Training Set to establish a framework for future prioritisation of work on food additive interactions	01/04/98	30/09/99	
FS1646	An improved analytical method for gellan gum	01/06/98	31/05/99	
RISK ASSESSMENT (FS17)				
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
FS1710	Mechanisms of modulation of carcinogenesis by antioxidants: Genetic control of the anti-carcinogenic response	01/08/93	30/09/97	25,859
FS1713	The use of biomarkers, including DNA adduct formation, in human risk assessment of genotoxic food contaminants	01/07/94	30/06/97	15,445
FS1715	Assessment of human exposure to reactive metabolites of dietary genotoxins	17/10/94	31/05/98	74,878
FS1716	The role of diet in the modulation of human exposure to genotoxic agents as measured by DNA and protein adducts	01/09/94	31/08/97	64,563
FS1720	A geographic information system to indicate areas at risk following fires or releases of chemicals	01/04/95	30/11/97	28,866
FS1722	Measurement of carcinogen DNA and protein adducts using accelerator mass spectrometry as an aid to carcinogen risk assessment	01/01/96	31/12/98	120,796
FS1727	Development of PB-PK Models for Food Chemicals and Contaminants	01/04/96	30/09/97	39,335
FS1729	Biomarkers of reactive nitrogen species: Their role in genotoxicity and the effect of diet	01/10/96	30/09/99	108,359
FS1730	An investigation of appropriate methods for inter-species scaling in risk assessment	01/04/97	31/03/98	56,555
FS1731	Can biomarkers be used to assess the carcinogenic potential of heterocyclic amines?	01/06/97	31/05/00	59,460
FS1732	Heterocyclic amines as risk factors in colon cancer	01/06/97	31/05/00	124,666
FS1733	Measurement of the formation of MeIQx- and PhIP-DNA adducts in human colon cancer and non-cancer patients (part of collab. study)	01/06/97	31/05/00	128,549
FS1735	Food risk assessment fellowship	01/09/97	31/08/00	74,249
FS1736	Development of an *in vitro* intestinal cell model to predict bioavailability of food components in humans	01/04/98	31/03/01	
FS1737	Can cruciferous vegetables or other dietary constituents alter the genotoxicity of heterocyclic amines following human consumption of cooked meat	01/06/98	31/05/01	
FS1738	Cruciferous vegetables and drug-metabolising enzyme phenotype	01/04/98	31/03/00	

RISK MANAGEMENT (FS18)				
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
FS1824	Young peoples understanding of communications about food related risks	01/10/94	15/10/97	25,910
FS1833	CROM (Cognitive Route Model of Perception of Food Risk)	01/10/95	30/09/98	59,556
FS1836	Investigation of the practicability of the alternative approaches to regulating food chemical contamination	01/05/95	30/04/97	3,817
FS1844	The impact of information content and presentational context on perceptions of specific food risks	01/04/97	31/03/00	89,442
FS1845	Information sources and their influence on public perceptions of food hazards	01/06/97	31/05/99	47,690
FS1847	Comparison of different sampling techniques to assess public perception of food risk: Development of a surveillance approach	01/05/98	30/04/00	
FS1848	Impact of media reporting of risk on public risk perceptions	01/04/98	30/09/98	
NATURAL CONSTITUENTS OF FOOD				
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
CS0107	The decontamination of aflatoxin in feed	01/01/95	31/12/97	12,836
FS2001	Evaluation of Non-nutrient Dietary Constituents in the Prevention of Breast Cancer	01/03/94	31/07/97	10,550
FS2032	Synthesis of saxitoxin	01/12/94	28/02/98	39,669
FS2034	The biological effects of phytoestrogens	01/09/94	31/12/97	54,402
FS2035	Accumulation and fate of blue-green algal toxins in fish	01/06/94	31/05/97	12,293
FS2044	Use of recombinant human oestrogen receptor to assess dietary exposure to phytoestrogens	01/04/95	30/06/98	87,812
FS2050	Fate of Ochratoxin A and Fumonisin B1 and other mycotoxins during commercial processing of cereals	01/04/95	31/03/98	64,292
FS2052	The effects of dietary polyphenols on the proliferation and progression of human and mouse pre-malignant lesions	01/10/95	31/03/99	63,801
FS2053	The biological activity of soya phytoestrogens in neonatal cells	01/04/96	31/03/99	129,020
FS2055	Distribution, structure and some effects on xenobiotic-metabolising enzymes of lignols found in fruit and veg	01/09/96	31/08/99	16,287
FS2056	Formation of aralkyl isothiocyanates from dietary glucosinolates. Effects on gene expression, cell growth and viability	01/09/96	31/08/99	43,996
FS2058	Comparison of the metabolism of agaritine in rat and mouse	01/05/96	30/04/98	61,337
FS2060	Synthesis of labelled and unlabelled isoflavonoid phytoestrogen standards	01/05/96	30/04/99	45,900
FS2061	Development of a rapid, effective and inexpensive ELISA-based method for patulin detection in apple products	01/05/96	30/04/98	65,125
FS2062	Review of certain aspects of the literature on phytoestrogens, lignans and mycoestrogens in the human diet	01/07/96	31/07/97	14,313
FS2063	Further investigations on patulin formation in apples stored for juice production	01/04/97	31/12/99	25,450

FS2064	Expansion of NOTIS database to include data on protective factors	01/04/96	30/09/97	29,786
FS2067	Dietary phytoestrogens; possible beneficial and adverse effects in men	01/02/97	31/01/00	47,617
FS2069	Dietary phytoestrogens: possible effects on prostate cancer and 5-a reductase activity	01/01/98	30/06/00	
FS2071	Effects of phytoestrogens and related dietary components on bone metabolism	01/02/97	31/01/00	47,850
FS2072	Quality assurance for the analysis of isoflavones and metabolites in foods and biological samples	01/04/97	31/03/99	120,000
FS2073	Absorption, distribution, metabolism and excretion of [14C] labelled genistein	01/04/97	31/03/99	40,700
FS2074	*In vivo* effects of vegetables and tea on human colonic bio-markers indicative of cancer-prevention	01/06/97	31/05/99	22,323
FS2075	Development and application of screening assays for the beneficial and adverse effects of phytoestrogens in food	01/04/97	31/03/00	49,251
FS2076	Investigation of the post-natal developmental toxicity of isoflavones in rats	01/05/97	30/04/99	97,830
FS2078	Identification, synthesis and determination of alkyl resorcinols and their metabolites	01/04/96	31/03/99	37,035
FS2079	Study of the transfer of ochratoxin A from feed to pigs	01/04/97	31/03/98	4,666
FS2080	An evaluation of the toxicology of detoxified groundnut meal	01/03/97	31/10/97	17,514
FS2082	The whole food approach: Development of a new approach to the risk assessment of inherent natural toxicants	01/08/97	31/01/98	22,736
FS2083	The absorption, distribution, metabolism and excretion of isoflavones *in vivo*	01/01/98	30/06/99	
FS2085	The use of biologically produced 13C enriched isotopomers of the phytoestrogens for use as analytical standards as tracers in humans	01/12/97	30/11/99	4,830
FS2086	Absorption and metabolism of dietary phytoestrogens in humans - effect of age, gender, food matrix and chemical composition	01/07/98	31/03/00	
FS2087	Influence of human gut microflora on dietary soya isoflavone phytoestrogen bioavailability in adults and children	01/10/98	30/09/00	
FS2088	Prevention of mycotoxin contamination of cereals by application of HACCP techniques from field to end user	01/01/98	31/12/98	11,043
FS2089	Reducing patulin in apple juice through manipulation of horticultural practices in orchards	01/04/98	31/03/01	
FS2090	The effect of low and high input farming systems on the occurrence of mycotoxins in grain	01/04/98	31/03/01	

CHEMICAL CONTAMINANTS FROM FOOD PRODUCTION (FS21)

PROJECT NO	TITLE	START DATE	END DATE	EST. COST 97/98 (£)
FS2150	Organic environmental contaminants in sludge-amended soils	01/10/94	31/12/97	20,919
FS2151	Mass balance and distribution studies of PCBs and other organochlorines in grazing animals	01/10/94	30/09/97	83,312
FS2153	Cadmium balance study in infants	01/04/94	30/09/97	35,856
FS2173	The effect of cadmium speciation on uptake from the diet	01/04/95	31/03/98	22,292
FS2175	The effect of cadmium speciation on uptake from the diet	01/04/95	31/03/98	85,840
FS2176	Organic contaminants in sewage sludge amended soils, further studies of their environmental and food safety significance	01/03/96	28/02/99	109,841
FS2179	Transfer of heavy metals from feeding stuffs and environmental sources into meat, milk and other foods of animal origin	01/09/95	01/06/97	12,486

FS2188	Study of metabolism of dietary [15N] nitrate in man	01/05/95	30/04/97	5,999
FS2190	The use of sorptive minerals to minimise the uptake of arsenic (As) and cadmium (Cd) by food crops in contaminated soils	01/07/96	30/06/99	65,632
FS2191	Development of a mechanistic understanding and model of the air-herbage transfer of persistent organic contaminants	01/02/98	31/01/01	50,000
FS2192	Generic model of human terrestrial foodchain exposure to persistent organics: Application to PCDD/FS and PCBs	01/10/96	30/09/97	31,289
FS2194	Development of a mechanistic understanding and model of the air-herbage transfer of persistent organic contaminants	01/02/98	31/01/01	50,000
FS2196	A feasibility study on the potential for exploiting genetic variability in crop and non-crop species to remove	01/11/96	31/10/97	40,402
FS2197	A feasibility study on the potential for exploiting genetic variability in crop and non-crop species to remove	01/11/96	31/10/97	12,848
FS21100	Evaluation of immunochemical methods for PCBs in fish oils	01/07/96	30/04/97	28,108
FS21101	Selective extraction of PCBs from both aqueous and oleaginous foodstuffs using recycling perfluorocarbon fluids	01/04/96	31/05/97	9,011
FS21102	Development and validation of models to estimate food-chain effects of industrial pollution of freshwater systems	01/04/96	31/03/97	10,431
FS21103	Modelling the migration of inorganic contaminants through freshwater systems, validation and sensitivity studies	11/06/96	10/06/97	20,105
FS21104	Development and application of a biomarker-based method to quantify human exposure to phthalates from food	01/04/96	31/03/99	49,701
FS21108	Development and application of a biomarker based method to quantify human exposure to phthalates from food (BIBRA)	01/04/96	31/03/99	89,444
FS21111	A simple, robust assay for dioxins in foods using a fluorescent liposome enhancement immunostrip	01/05/97	31/03/99	69,522
FS21112	Simple methods to reduce potential transfer of organic chemical residues from sewage sludge amended soils to food crops	01/10/97	30/09/00	27,305
FS21113	Development of an international contaminant flux database for risk assessment modelling	01/07/97	30/06/01	6,773
FS21114	Assessment of the potential role of GC-MIP-MS in the determination of organic contaminants in food	01/08/97	31/07/98	56,567
FS21115	An investigation into the sources of polynuclear aromatic hydrocarbons (PAHs) in infant formulae	01/06/97	05/10/98	55,587
FS21116	Validation of a sensitive HPLC method for determination of nitrate and nitrite in meat, milk and products derived from them	01/04/97	31/03/98	72,174
FS21118	Effectiveness of the UK codes of GAP for the production of lettuce and spinach in minimising nitrate residues	17/10/97	31/08/98	6,450
FS21119	Assessment of total oestrogenic environmental contaminants in food with recombinant human receptor systems	01/04/98	31/03/01	
FS21120	Food hazard analysis by critical control points (HACCP): development and evaluation of a whole food chain approach	01/05/98	30/04/99	

FS21121	Development of analytical methodology and measurement of dietary exposure to alkylphenols and alkylphenol ethoxylates	01/04/98	31/03/99	
CHEMICAL CONTAMINANTS FROM FOOD CONTACT MATERIALS (FS22)				
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
FS2217	Migration from coatings on metal containers into foods	01/07/94	30/06/97	9,782
FS2218	A novel non-invasion method for studying the interaction between foods and packaging	01/10/94	30/09/97	29,213
FS2219	Migration studies: Food contact elastomeric materials	01/06/94	31/05/97	7,374
FS2223	Chemical composition and migration levels of packaging adhesives	01/06/95	31/05/98	49,304
FS2224	Certified reference material and migration test method for fatty contact in support of EEC directives	01/04/95	31/03/98	2,180
FS2225	Evaluation of the scientific basis of EC directives 82/711 and 85/572 - migration into simulants versus foods	01/09/95	31/08/98	79,968
FS2227	Chemical composition and migration levels of packaging adhesives	01/04/95	31/03/98	24,537
FS2230	Identification of stages in the production of paper and board packaging materials where hazards to food safety	01/04/96	31/03/98	64,831
FS2233	Development of a strategy for the effective enforcement of food contact plastics legislation	01/06/96	31/12/97	24,262
FS2234	Hydrolysis of polycarbonate baby bottles and migration of bisphenol A to infant feed	01/04/96	31/07/97	7,010
FS2235	Tenax as an alternative to olive oil for migration testing microwave susceptors	01/06/96	31/03/98	26,635
FS2236	Migration test protocols for electroplated and dipped metalware intended for food contact	01/06/96	31/08/97	17,168
FS2237	Investigations into how glass fibre reinforced (GFR) vats can be repaired to minimise migration of styrene into food	01/11/96	31/10/97	2,645
FS2238	Development of a strategy for the effective enforcement of food contact plastics legislation	01/06/96	31/12/97	26,485
FS2239	Methods and searchable mass spectroscopic libraries for the identification of substances migrating above a 1 ppb threshold	01/04/97	31/03/00	76,478
FS2240	A definitive test for set-off of pigments and other non-volatile substances on flexible food packaging	01/06/97	31/05/00	63,944
FS2241	Investigations into the use of overall migration methods to test for substances with high specific migration limits	01/06/97	31/05/98	17,671
FS2242	A regiospecific immunoassay screening test for contaminants from food contact plastics	01/04/97	31/03/99	14,475
FS2243	A systematic evaluation of chemical migration during low temperature storage of packaged foodstuffs	01/06/97	31/05/99	41,938
FS2244	Can overall migration be used as a measure of both the safety and quality of plastics used in connection with food and drink?	01/04/97	31/03/99	29,683
FS2245	An investigation of the migration of metals from glazed ceramic ware	01/04/98	30/03/00	
FS2246	A flexible food consumption approach using food-type factors and packaging-usage factors leading to refined restrictions to migration	01/04/98	30/09/99	
FS2247	Investigation into the effects of the freeze-thaw cycle on chemical migration from packaging into foods	01/04/98	30/09/99	
FS2248	Further research on chemical migration from food contact rubber and other elastomers	01/04/98	31/03/00	
FS2249	Investigation of the migration of chemicals from agglomerate and natural cork stoppers	01/04/98	31/03/00	

IMPROVED METHODS OF ANALYSIS (FS29)				
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
FS2911	Estimation of the effect of frequency of proficiency testing on the performance of laboratories	01/06/95	31/05/97	13,108
FS2914	Production of a protocol for the in-house validation of methods of analysis for food	01/04/97	31/03/98	23,651
FS2915	The development of a protocol for the application of recovery in food analysis	01/04/97	31/03/98	19,676
FS2916	Determination of organic acids in liquid egg by capillary electrophoresis	01/04/97	31/03/98	22,845
FS2917	Modern statistical methods in analytical chemistry	01/09/97	31/08/99	4,684
FS2918	To assess the contribution of sampling procedures to the uncertainty of food analysis	01/04/97	31/03/98	69,196
FS2919	Development of a method to detect the use of centrifugation in the preparation of pasteurised liquid egg	01/04/97	30/06/98	51,000
FS2920	Multivariate quality control	01/08/97	31/07/98	20,886
FS2921	Fitness for Purpose of Food Analysis and Sampling	01/05/98	31/01/99	
FS2922	An investigation of the practical application of new guidelines on recovery factors in the food sector	01/04/98	31/03/99	
FS2923	Quality assurance procedures and microbiology laboratory performances	01/04/98	31/03/99	
FOOD INTOLERANCE (FS30)				
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
FS3006	The development of diagnostic assays for food induced anaphylaxis	01/04/95	31/03/98	54,318
FS3007	The prevalence and natural history of peanut allergy and the investigation into its genetic environmental and immunological determinants	01/12/95	30/11/98	217,485
FS3008	Consequences of avoiding self treatment or enduring symptoms believed to arise from food intolerance; a community study	01/05/95	31/08/98	96,640
FS3009	Development of food intolerance in atopic and non-atopic families: influence of maternal nutrition and infant feeding	01/10/96	30/09/99	97,195
FS3010	The use of a chimaeric intestinal SCID mouse model as a novel approach to study human food intolerance	01/10/96	30/09/02	59,556
FS3012	Prevalence and pathogenesis of food allergies in children	01/04/96	31/03/99	92,464
FS3015	Do food additives cause hyperactivity and behaviour problems in a geographically defined population of 3 and 5 year olds?	01/07/97	30/06/00	38,636
FS3017	The effect of exposure to food protein via material sources in the development of food allergy in infants with a family	01/05/97	30/04/00	85,952
FS3018	Anaphylactic reactions to nuts: cross-reactions between nuts or multiple sensitivities?	03/03/97	01/05/97	4,750
FS3019	Adverse reactions to foods: BIBRA international	01/09/97	31/08/00	6,667
FS3020	A clinical trial to investigate potential allergenic reaction from the ingestion of storage mites	14/07/97	13/07/99	21,535
FS3021	Isolation and Characterisation of allergens in unrefined peanut oil	01/04/97	31/03/99	41,185
FS3022	Identification and characterisation of key allergens in peanut by studying cross reactivity with soybean and tree nut	01/04/97	31/03/99	49,524

FS3023	Development of methods to predict the allergenic potential of genetically modified foods (formerly FS0218)	01/05/97	31/03/00	114,006
FS3024	Study of the factors influencing the protein content of cold pressed oils (formerly FS0220)	01/04/97	31/03/99	24,993
FS3025	Construction of an allergenic epitope database	01/04/98	31/03/99	
FS3026	Development an *in vitro* screening method for allergens in novel foods	01/04/98	30/09/00	
FOOD IRRADIATION (FS19)				
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
FS1917	Studies to develop a rapid screening test for irradiated food	01/10/96	31/03/98	38,007
FS1919	Detection of irradiated food via determination of hydrogen	01/03/97	28/02/98	4,885
FS1920	Optimisation of an ELISA method to detect irradiated food	01/10/97	31/03/98	9,627
ASSESSMENT OF RADIOACTIVE DISCHARGES (RP01)				
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
RP0125	CONDOR Users Group	01/04/94	31/03/99	5,500
RP0137	Review of radionuclide transport and bioaccumulation processes in natural and semi-natural environments	01/06/95	31/05/97	2,833
RP0138	Examination of the speciation of tritium, carbon-14 and sulphur-35 discharged from different nuclear establishments	01/06/95	31/05/98	45,006
RP0141	Uncertainties in assessments of terrestrial foodchain doses: sources and implications	01/04/95	30/06/97	5,047
RP0142	Assessment of the variability of critical group doses and implications for dose limitation	01/04/95	30/09/97	8,118
RP0149	Review of the effects of long-term ageing on the behaviour of Radionuclides in Soils	01/04/96	30/06/97	14,462
RP0151	Development of an International Radionuclide Flux Database	01/09/96	31/08/00	13,952
RP0152	Habits Surveys: Terrestrial Foods and Sources	01/04/96	31/03/99	48,154
RP0153	The effect of I-129 speciation on deposition and transfer to food crops	01/04/96	31/10/98	22,220
RP0154	Technical support for MAFF assessment of foodchain impact following disposal of radioactive waste in s/w repositories	01/09/96	31/08/97	9,362
RP0156	Dynamics of tritium uptake and loss following a short term release (extension)	01/04/96	31/03/98	61,264
RP0157	Modelling and experimental study on the transfer of deposited radioactivity to fruit	01/05/96	31/07/99	25,202
RP0158	Parameters and sub models for dry deposition of particulate contaminants to shrubs and fruit trees	01/05/96	30/04/99	58,392
RP0159	Revision of the STAR - H3 and STAR - C14 Codes in the Light of New Experiments and Field Data	01/04/96	31/03/98	6,809
RP0160	Deposition of gaseous H-3,C-14 and S-35 to fruit	01/10/96	31/10/99	14,538
RP0161	Development of ADMS 3	01/08/96	01/01/98	13,320
RP0162	Parameters and sub-models for wet deposition of soluble and particulate contaminants to crops	01/09/96	31/08/99	43,473
RP0163	Review of aquatic dispersion models for radiological assessments for radioactive liquid discharges to the environment	01/04/97	14/11/97	19,869
RP0164	Development of a model for the prediction of sulphur 35 content in crops	01/10/97	30/09/00	9,130

RP0165	Development of a carbon isotope technique for the characterisation of gaseous plumes from nuclear power reactors containing carbon 4	01/04/97	31/03/98	5,149
RP0166	Technical support for MAFF in assessments of the foodchain impact of disposal of solid radioactive waste in shallow or deep repositories	01/04/97	31/03/98	15,319
NUCLEAR EMERGENCIES (RP02)				
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
RP0228	A cost benefit analysis of the options available to MAFF for the release of restricted areas in England and Wales	01/01/96	30/06/98	26,787
RP0241	Emergency Response for Domestic Food Production	01/08/96	30/09/97	21,110
RP0242	Investigation of Measurement Based Statistical Estimation and Characterisation Techniques for use During Accident Resp	01/11/96	31/10/00	47,364
RP0243	The effectiveness of alginates to reduce the transfer of RAD iostrontium to the milk of dairy animals	01/04/96	31/03/98	53,124
RP0244	Spatial Analysis of Vulnerable Ecosystems in Europe (SAVE) Spatial and dynamic predictions of radionuclide fluxes into	01/04/96	31/03/00	20,000
RP0246	Investigation of the feasibility of producing a mobile radiation monitoring unit for nuclear emergencies and incidents	01/04/97	31/03/98	14,969
RP0247	A review of public concerns and reactions about food safety following a release of food contaminants (radioactive/other)	01/05/97	31/05/98	10,000
RP0249	Optimising emergency sampling strategy following a release of radioactive material into the environment	01/04/97	31/03/98	31,983
RP0250	An analysis of the Geographical Information System needs of Radiological Safety Division	01/04/97	31/08/97	16,985
ENVIRONMENTAL RADIOACTIVITY RESEARCH IN SUPPORT OF SURVEILLANCE (RP03)				
PROJECT NO	**TITLE**	**START DATE**	**END DATE**	**EST. COST 97/98 (£)**
RP0317	Dietary study to assess intake of radionuclides of people living close to nuclear installations	01/04/95	31/03/00	74,264
RP0318	Evaluation of the radiological impact of free foods found in the vicinity of nuclear sites	07/08/95	31/12/97	27,609
RP0319	The assessment of performance and establishment of a quality control programme for the determination of radionuclides in food stuffs	01/04/95	31/03/98	6,666
RP0320	Optimisation of MAFF's monitoring programme : Development of a computer-based decision aiding tool	01/10/95	31/03/98	21,854
RP0321	The development of a controlled release lamb bolus for the prevention of radiocaesium uptake into the lamb's body	01/05/97	30/04/99	44,004
RP0322	The development and testing of rumen dwelling AFCF delivery devices suitable for upland lambs	01/04/97	31/01/99	24,951

ANNEX III

APPLICATION FOR A RESEARCH CONTRACT WITH MAFF

The attached application form should be used for all applications for research funding in response to the requirements listed in this document.

Before completing the form you should read carefully the notes in the introduction section of this requirements document.

The application form contains guidance notes on how the form should be completed. If however you find difficulty or require clarification, you may call for advice on the following helplines:

1. For enquiries about the science in your proposal, or MAFF's requirements in a particular research area, you should contact the relevant MAFF Programme Adviser. These numbers are listed at the end of each section in the requirements document.

2. Enquires relating to resources and completion of section 3 of this application should be made on the following number: **Please note that MAFF will be issuing fixed price contracts for all proposals accepted in this and future commissioning rounds, and this should be taken into account when preparing project cost estimates.**

HELP LINE : 0171 921 2205

3. General enquires which do not relate to either of the above should be made on the following number:

HELP LINE : 0171 921 3965

Ministry of Agriculture, Fisheries and Food
Chief Scientist's Group, Nobel House
17 Smith Square, London SW1P 3JR
Telephone No. 0171-238 3000

For MAFF Use Only	
Proposal Code	
Date Received	

Application for a Research Contract with MAFF

- **Applicants should complete each part of the form as fully and clearly as possible. If there is insufficient space for an answer, please continue on pages 22-24, indicating the question number.**
- **Please note that if two or more projects are being submitted a separate CSG 7 must be completed for EACH project. This applies even if projects are interdependent.**

Please use TYPESCRIPT or BLOCK LETTERS and BLACK INK

GENERAL

1. Proposer's full name and title

Tel. No. (incl. STD code)

Position held

Fax No.

E-mail No.

2. Name and address of Organisation

Postcode

3. (a) Project title (maximum 120 characters)

(b) Abstract of research. To include the main objective, policy relevance and intended use of results:

(c) Total cost to MAFF (excluding VAT)

(d) Date submitted to MAFF

SECTION ONE - SUMMARY

4. (a) Sub-contractor's name(s) and address(es) (if applicable):

Postcode

Postcode

(b) Joint contractor's name(s) and address(es) (if applicable):

Postcode

Postcode

5. (a) MAFF reference under which proposal has been submitted e.g. Central Strategic Research Fund or other open competition advertisements, Food Research Requirements or ROAME A forms (i.e. MAFF customer guidance on the problems to be addressed and the required objectives of the research).

(b) Duration in years (or months if less than one year)

(c) Proposed start date

6. **Summary of total estimated costs (excluding VAT).** This should include the costs of the research work which will be funded by (a) MAFF, (b) Bodies other than MAFF, (c) 'in kind' contributions as a cash value, as appropriate.

Funding bodies	Year 1	Year 2	Year 3	Year 4	Year 5	Total (£)
(a) MAFF						
(b) Other than MAFF						
(c) 'In kind'						
TOTAL COST						

N.B. Applicants are advised to clear the costs at question 18 with their respective Finance departments and to agree the value of any 'in kind' contributions with those involved with the work before completing this summary.

SECTION TWO - SCIENCE

MAFF funds research in support of its policy requirements. These are described in the MAFF R & D Strategies, and individual programme objectives may be described in more detail in ROAME A's or in documentation supporting advertised calls for proposals.

7. **Purpose.** Summarise the scientific or technical problem which you propose to address and give reasons why MAFF support should be given.

8. **Scientific context.** Please describe how your proposal relates to the current state of knowledge (fully reference, see Annex B) and in which ways the results will advance scientific/technical understanding.

9. **Objective(s).** Please give details of (a) each scientific objective, (b) to what extent these objective(s) are interdependent and (c) whether any factors exist to delay achievement of the objective(s).

(a) **Scientific Objective(s)** (Technical and Scientific aims of the research which must be measurable and timebound, please number the objectives.) **If your application is accepted, these Scientific Objectives will be included in the agreement between you an the Ministry. Please, therefore, restrict your entry to the salient points and set these out clearly and concisely.**

9. **Objective(s) continued**

(b) **Interdependence of Objective(s).** To what extent does the success of one scientific objective depend on the successful completion of another? How essential is each scientific objective in achieving the overall objective?

(c) **Please give details of any particular factors which might cause delays in the achievement of these objective(s).** What are the chances of this happening, what are the probable consequences and what steps will you take to prevent this happening?

10. (a) **Approaches and Research Plan.** Outline the experimental approaches to be used in realising the scientific objectives and set out the work plan for the life of the project stating clearly how you intend to proceed. Please number the Approaches in the same way as the Objectives, **If your application is accepted, the Approaches and Research Plan will be included in the agreement between you and the Ministry. Please therefore, restrict your entry to the salient points and set these out clearly and concisely.**

10. (a) **Approaches and Research Plan continued.**

Tick appropriate box

(b) Will the research require a survey to be carried out, or a questionnaire to be used? YES ☐ NO ☐
(Surveys are only acceptable if they form an essential part of the project. Ministerial approval is required, and time must be allowed for this before any agreement is signed.)

SECTION TWO - Continued

11. **Milestones.** Based on your research plan, please give milestones (i.e. points at which progress can be assessed) with target dates for monitoring progress of the research towards the scientific objectives. Each milestone should relate to one scientific objective, i.e. the milestones for objective 1 should be numbered 01/01, 01/02 etc. Each milestone title should not be more than 120 characters, a description is optional.

    (a) **Primary** milestones. (These must number no more than four in each project year. Achievement of each must be **essential** if the objectives of the project are to be met. If your application is accepted, they will form part of the agreement between you and the Ministry.)

Milestone No.	Target date	Title

(b) **Secondary** milestones. (These are unrestricted in number. They should be helpful to the management of the project but not essential to the achievement of the objectives. If your application is accepted, they will not form part of the agreement between you and the Ministry. Please prefix number of milestones with an S to indicate that it is a **Secondary** milestone.) (If necessary, continue on a separate sheet.)

Milestone No.	Target date	Title

12. **Quality Assurance.** Please state what procedures you operate for Quality Assurance, including registration to BS 5750/ISO 9000, NAMAS or GLP.

Tick appropriate box

13. Does any of the work outlined in the proposal require a licence from the Home Office under the Animal Scientific Procedures Act 1986? YES ☐ NO ☐

14. **Equipment devoted to project**

(a) Please list the existing capital equipment which you will use for this project.

(b) Give justification for, and estimated cost of any new capital equipment which will have to be purchased for this project for which you expect MAFF to contribute. N.B. MAFF will not normally contribute to the cost of any new item that will duplicate one already in your possession. (See Section 3, note (d).)

15. **Staff effort**

(a) Please list the names and grades of staff who will work on the project together with details of their specialism (including relevant papers published).

(b) Please state how many working days equals one staff year _____ days

(c) **Summary of staff time involved.**

	GRADE	STAFF TIME Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL TIME
You should show here the staff years (to first decimal place only) expected to be spent on the project for each grade of staff involved, including both scientists and assistants, during each year of the project.							
	TOTAL STAFF YEARS						

16. **Communication of Results**

(a) How will the Results be communicated? Please list anticipated numbers and if possible expected dates for submission of e.g. publication in refereed journals, trade journals or the press, presentations or demonstrations to the scientific community or trade organisations and internal reports or publications.

N.B. In any publication including press articles, wherever possible, you MUST acknowledge the financial support of the Ministry.

(b) What measures will be taken to encourage technology transfer?

17. **Benefits.**

(a) Please describe and quantify the benefits which may arise from this project, how the results will be used and who will make use of the results of this research (e.g. the Ministry, industry or consumers).

(b) Do you think further research or development will be needed before these benefits can be realised?

17. **Benefits continued**

(c) Is the proposed research likely to lead to:

Tick appropriate box

(i) patentable Results? YES ☐ NO ☐

(ii) commercially exploitable Results? YES ☐ NO ☐

If '**YES**', please give details including interest already expressed.

SECTION TWO - Continued

18. **Other details**

Tick appropriate box

(a) Is this work currently or about to be submitted in another application elsewhere? YES ☐ NO ☐

If **YES**:

- to which organisation?

- and by what date is a decision expected?

(b) With reference to questions 6(b) and (c) please give a brief description of the nature of their contribution. (A letter agreeing to the collaboration should be attached to this application.)

(i) Funding contributions other than MAFF

(ii) 'In kind' contributions

SECTION THREE - RESOURCES

FINANCIAL GUIDELINES FOR PROJECT COST ESTIMATES.

Once a price for the project has been agreed with the Ministry, and an agreement signed, no increase in price can be considered. **Please note that any over or underspends in any one project year cannot be carried over into the next project year.**

The following Notes are to help you provide all the details necessary for the project costs.

19. (a) **Pay costs**

You should include the costs of personnel working directly on the project. Your costings must be supported by a detailed breakdown showing for each person separately:

(i) the amount of staff time (e.g. number of days, months or years) by grade / salary bands for each year of the project including staff to be recruited;

N.B. An explanation should be given where the staff effort increases or decreases during the life of the project.

(ii) the proposed annual salary (including London (or other town) Weighting Allowances, employers NI and Superannuation) and salary spine point (i.e. pay band) of each person during each year of the project.

In appropriate cases, the Ministry is willing to accept pay calculations on the basis of average pay costs. In this event you should indicate the average pay used for the grade(s) in question.

(b) **Inflation**

(i) If the project is submitted under a competition, a percentage to cover inflation can be built into the price, but please bear in mind that overall cost is a factor in the selection process.

(ii) If the project is not submitted under a competition, costings must be submitted at current prices, and MAFF will add an allowance for inflation in line with the Treasury's forecast of GDP deflator.

(c) **Consumables**

These will be essentially scientific laboratory supplies, (e.g. glassware, chemicals) costing individually up to £2,000 in value which are purchased from third parties. Please list separately all consumables to be used, including, if possible, quantities.

(d) **Equipment**

Capital equipment is a fixed asset costing over £2,000 in value which is expected to yield continuous service beyond the year in which it is purchased. It includes items such as scientific and information technology equipment. **The equipment must be essential to the carrying out the project.** Three quotations **must be** obtained for each item of equipment. (See note (ii) below.)

For new equipment the Ministry will only fund that proportion of its working life (normally 5 years) to which it is used solely on the project (i.e. if a project is of 3 years duration the Ministry will fund $^{3}/_{5}^{th}$ of the cost at the rate of 1/5 each year. Where equipment has a useful life of more than 5 years and/or is used for other purposes, you should make an appropriate reduction in the annual rental charged to the Ministry. Where new equipment is required please give details of the make, model, price and the year when each item is to be purchased and its purpose. Likewise, please indicate when equipment is to be leased from the manufacturer and give details of the costs of rental for each year.

A piece of equipment may need to be allocated full-time to a project. In such a case, the fact that an organisation owns a similar piece of equipment for use on other projects does not remove the need here for that equipment to be either purchased or hired, although the usual rules on the amount to be paid will apply. It is however for the contractor to justify such a purchase.

You may be asked by the Ministry to provide the following as appropriate:

(i) the **original** purchasing invoice or top copy of the rental agreement. This will be returned immediately after a copy has been taken; **and**

(ii) the original written quotations obtained from three different suppliers.

N.B. In appropriate cases e.g. where it can be shown that the technical specification of equipment precludes all but a single supplier, a single oral/written quotation will be acceptable.

(e) **Travel**

Visits to conferences and similar functions in the U.K. or elsewhere and any foreign visits **will not** normally be regarded as an eligible cost. Exceptionally, however, such costs may be funded where you can demonstrate to the Ministry's satisfaction that the visits are **essential** to the project.

Where travel costs are necessary, details of their frequency, purpose, destination, the mileage and rate per mile (for road travel), air/rail fares, and number of persons travelling should be given.

(f) **Overheads**

Central and departmental costs (direct) that underpin the research activities and costs (indirect) which cannot readily be uniquely assigned to particular research projects. These may include the following:

- financial services (finance, accounting, tendering, marketing);
- personnel services;
- staff facilities (transport, health and safety, training, welfare, laundry);
- departmental services (administration, library, secretarial, printing, minor stores items and laboratory and workshop support).

You should include details of the method of calculation of the overhead rate, (to be expressed as a percentage of direct salary costs (excluding Superannuation and NI) plus consumables) and list **separately** the items covered.

(g) **Sub-contracts, consultancy fees, etc.**

You should show that this work is essential to the success of the project. Any costs under this heading must be identified separately.

Please detail **separately** the component parts of any consultancy or sub-contract, including pay costs, consumables, equipment, travel, overheads and other costs which have been included.

(h) **Other costs**

You should include here items which do not readily fit under the headings provided e.g. laboratory/analytical services, laboratory animals, servicing of equipment, any non-equipment rental charges, recruitment costs, computer software, stationery items, student registration fees and glasshouse heating.

You should also provide a short explanation of the need for all the items you list here.

(i) **VAT**

Businesses who are registered for VAT should include their registration number and the full amount of VAT to be charged to the Ministry.

(j) **Ineligible costs**

The following are excluded from eligible costs:

- interest charges;
- hire purchase interest and any associated service charges;
- profit earned by a subsidiary or by an associated undertaking on work sub-contracted under the project;
- input VAT (an allowance may be negotiated with organisations with limited scope for recovery of input VAT);

N.B. Contingency allowances expressed as an arbitrary percentage overall addition to eligible costs are excluded.

18. **Estimated total project (all funding bodies) costs - detail**
Before completing this section you should read carefully the Notes on pages 16 and 17 which explain what project costs the Ministry is prepared to consider. **These must be project year figures, not financial year costs.**

Project Year	Year 1 £	Year 2 £	Year 3 £	Year 4 £	Year 5 £	TOTAL £
Pay costs (see note a)						
Consumables (see note c) (specify):						
Equipment (see note d): (specify)						
Travel expenses (see note e):						
Overheads (see note e): (specify):						
Sub contracts, consultancy (see note f)						
Other costs (see note h):						
TOTAL PROJECT COSTS						
VAT (see note i)						

Tick appropriate box

(h) Are you registered for VAT? YES ☐ NO ☐

If **YES** what is your registration number?

Excluding VAT : see also note 19(b) – non- competitive work must be costed at current prices

SECTION FOUR - DECLARATION

DECLARATION

I confirm that I have read this application and that:

(a) MAFF may show this application to third parties for the purposes of obtaining expert opinion on its scientific merits; and

(b) if granted, the work will be accommodated and administered in our Organisation in accordance with MAFF's contractual arrangements. The staff gradings and salaries quoted are correct and in accordance with the normal practice of this Organisation.

19. (a) **Head of Department**

Signature _____ Date _____

Name and initials in BLOCK LETTERS _____

Organisation _____

(b) **Administrative Authority**

Signature _____ Date _____

Name and initials in BLOCK LETTERS _____ Position _____

(e.g. Finance Officer/Bursar/Registrar/ Secretary of Institution/Organisation)

Organisation _____

Full postal address _____

Postcode

Telephone No. (including STD Code) _____ Ext.

20. Name of project leader (if different from 1) _____

Address of project leader _____

Postcode

Telephone No. (including STD Code) _____ Ext. _____ Fax No.

Note: This application should be submitted by/through:

(a) **the Head of Deparment;** and

(b) **the officer who will be responsible for administering any funds that may be awarded.**

Each should sign the above declaration.

CURRICULUM VITAE OF STAFF TO BE ENGAGED ON THE RESEARCH Annex A

(Please add a page for each person to be engaged in the scientific aspects of the work.)

1. Surname | Forename(s)
2. Degrees:
3. Posts held (with dates). Where personal support is requested please identify tenure and source of funding of present post.
4. Recent publications and/or papers in the press.

BIBLIOGRAPHY

Annex B

References should be cited only as a number on the form, with full details listed here. All references listed should be numbered in the order that they appear on the form and should include a full list of authors, year, full title, publication title, volume number and page numbers.

If necessary, please continue on separate sheets, attach securely to this form and tick this box ☐

Ministry of Agriculture, Fisheries and Food